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# Endangered Species Act Section 7 Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation

# BIOLOGICAL OPINION

## IMPACTS OF TREATY INDIAN AND NON-INDIAN FISHERIES IN THE SNAKE RIVER BASIN IN YEAR 2001 ON SALMON LISTED UNDER THE ENDANGERED SPECIES ACT

Agency: U.S. Fish and Wildlife Service
National Marine Fisheries Service
Bureau of Indian Affairs

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

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Approved By: Donald R. Knowles
Director, Office of Protected Resources

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## INTRODUCTION

The National Marine Fisheries Service (NMFS) is required under Section 7 of the Endangered Species Act (ESA) to conduct consultations that consider the impacts of salmon fisheries on species listed under the ESA. This biological opinion considers the effects of fisheries proposed for the year 2001 in the Snake River basin (SRB) by the State of Oregon, the Shoshone-Bannock Tribe (SBT), Nez Perce Tribe (NPT), and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (hereafter referred to as "Parties"). Listed species in the action area that are potentially affected include Snake River (SR) spring/summer chinook, SR fall chinook, and SR sockeye salmon, and SR steelhead.

## CONSULTATION HISTORY

Fisheries in the SRB were managed under the Columbia River Fish Management Plan (CRFMP) and two subsequent interim agreements of the parties to U.S. v. Oregon from 1988 through July of 1999 when the agreements expired. The CRFMP was a consent decree adopted by the federal court in the case of U.S. v. Oregon. NMFS has provided consultation under section 7 of the ESA on proposed fisheries in the SRB since 1992 when SR sockeye, SR spring/summer chinook and SR fall chinook salmon were first listed under the ESA. While the CRFMP was in effect, the Technical Advisory Committee (TAC) of U.S. v. Oregon generally prepared biological assessments for proposed tribal and state fisheries which were submitted to NMFS by the U.S. Fish and Wildlife Service (USFWS). The TAC biological assessments considered treaty Indian and non-Indian fisheries within the jurisdiction of the CRFMP, with the exception of Idaho State fisheries in the SRB which were considered separately under section 10 of the ESA.

The first consultation regarding SRB fisheries occurred in 1992. The SBT submitted a biological assessment (BA) for their fisheries through the U.S. Bureau of Indian Affairs (BIA), Fort Hall Agency (BIA 1992). NMFS concluded that these fisheries were not likely to jeopardize the continued existence of SR sockeye , SR spring/summer chinook, or SR fall chinook salmon. In 1993-1998, Snake River biological opinions were expanded to address all fisheries, except those of Idaho, conducted by the parties to U.S. v. Oregon. In 1993 and 1994, NMFS issued biological opinions determining that these fisheries were not likely to jeopardize the existence of listed SR spring/summer chinook, SR fall chinook, or SR sockeye salmon (NMFS 1993a; NMFS 1993b; NMFS 1993c; NMFS 1994a; NMFS 1994b). In 1995 and 1996, NMFS issued "jeopardy" biological opinions with reasonable and prudent alternatives describing modified fisheries in the Pahsimeroi River, East Fork Salmon River, Yankee Fork, and the mainstem Salmon River from Sawtooth Hatchery to the Pahsimeroi River (NMFS 1995a; NMFS 1996a). In 1997, NMFS issued a "jeopardy" biological opinion for SRB fisheries with a reasonable and prudent alternative describing a level of take of SR spring/summer chinook salmon in the South Fork Salmon River (SFSR) area consistent with the conservation needs of the listed fish (NMFS 1997a). In 1998, the NMFS issued a "jeopardy" biological opinion (NMFS 1998), with a reasonable and prudent alternative describing modified fisheries in the upper Salmon River mainstem and the Pahsimeroi River. In 1999, NMFS issued a "jeopardy" biological opinion

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NMFS conducted a preliminary review of a draft BA of impacts for the 2001 fisheries that was received by email from TAC on April 26, 2001. NMFS provided initial comments to the parties in a letter dated May 7, 2001 (Dygert 2001). As has been the case in recent years, many of the proposed fisheries described in the BA would take place on groups of fish which are composed of a majority of listed fish. These would constitute direct take fisheries, which cannot be authorized through section 7, and therefore are not considered as part of this consultation. The NMFS letter also raised concerns with respect to the incidental take of listed fish in the proposed fisheries in the SFSR. The South Fork fishery was thus the subject of further consultation.

NMFS conducted preliminary assessments of a subset of the proposed fisheries on Lookingglass Creek, Rapid River, Clearwater River, and mainstem Snake River fisheries and those on the SFSR. Based on the available information, NMFS concluded that implementation of these fisheries prior to June 26, 2001 would not result in any irreversible or irretrievable commitment of resources which would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives (Robinson 2001a,b).

## BIOLOGICAL OPINION

## 1.0 DESCRIPTION OF THE PROPOSED ACTION

### 1.1 Proposed Action

Parties to U.S. v. Oregon propose to conduct fisheries in the SRB during the 2001 season. The action considered in this Biological Opinion includes 2001 fisheries in the SRB proposed by the NPT, the CTUIR, the SBT, and the State of Oregon, under the continuing jurisdiction of the U.S. District Court for the District of Oregon in the case of U.S. v. Oregon, Civil No. 68-513 MA (LeFleur 2001a and 2001b, Kutchins 2001a, Kutchins 2001b, Oatman 2001). The proposed fisheries will have impacts on ESA-listed fish, particularly SR spring/summer chinook salmon. In addition to the states and tribes listed above, three federal agencies – NMFS, USFWS,and BIA – are parties to U.S. v. Oregon. Agreement of these agencies, as well as the other parties, will be necessary for the fisheries to proceed without further order of the court. Once the consultation process is complete, it is the expectation of the tribes and states that their proposed fisheries will be agreeable to the proposing state and tribal parties, and will be approved by the participating federal agencies (NMFS, USFWS, and BIA).

The proposed fisheries consist of tribal ceremonial and subsistence (C&S) and non-Indian recreational fisheries directed at unlisted, hatchery-origin spring and summer chinook salmon This opinion considers whether fisheries to be conducted during the 2001 season in the SRB are

likely to jeopardize the continued existence of SR sockeye, SR fall chinook salmon, SR spring/summer chinook salmon, or SR steelhead listed under the ESA, or result in the destruction or adverse modification of their critical habitat.

Cindy LeFleur, Chairperson of the TAC, U.S. v. Oregon, submitted a BA to NMFS requesting section 7 consultation for 2001 fisheries on April 27, 2001 (LeFleur 2001a). TAC provided subsequent revisions to the BA on May 18, 2001 (LeFleur 2001b). The SBT and NPT prepared separate letters on May 29 and May 30, respectively (Kutchins 2001, Oatman 2001) which further clarified their proposals for the SFSR fisheries.

Idaho recreational fisheries in the SRB were considered previously pursuant to a section 10(a)(1)(B) permit application. Permit 1233 authorizes take associated with Idaho fisheries. With the exception of the State of Oregon's fishery in Lookingglass Creek, Oregon and Washington non-Indian recreational fisheries in the SRB are being considered through separate ESA Section 4(d) processes. Although non-Indian fisheries are, for the most part, not subject to consultation in this biological opinion, impacts associated with these fisheries are considered, in addition to proposed fisheries, where necessary and appropriate.

## 1.2 Action Area

For purposes of this Biological Opinion, the action area encompasses the SR and its tributaries upstream of its confluence with the Columbia River including the mainstem SR and Tucannon, Clearwater, Salmon, Grande Ronde, and Imnaha rivers .

## 1.3 Fisheries Proposed but not Considered

Table 2 summarizes the projected 2001 returns of spring/summer chinook salmon to hatchery and terminal areas in the SRB, and the estimated proportions of those returns listed under the ESA. As a result of the anticipated run compositions to terminal areas, and the existing regulations addressing listed hatchery-origin fish, several of the proposed fisheries described in the April 27, 2001 BA would take place on groups of fish which are composed of a majority of listed fish (LeFleur 2001a). These would constitute direct take fisheries. The regulations in force to protect threatened SR chinook salmon do not provide for direct take, with an available exception for research or enhancement takes under permit. In a May 7, 2001 letter to the TAC, NMFS indicated that fisheries directed at listed spring/summer chinook salmon in specified wild/natural production areas of the Salmon River including the Lower main, Middle main, Upper Main, South Fork above the South Fork weir, Middle Fork and Headwaters Salmon River; Lemhi River, and Grande Ronde wild/natural production areas; fisheries targeting listed Sawtooth hatchery, East Fork hatchery, and Pahsimeroi River hatchery spring/summer chinook; and the Tucannon and the Imnaha rivers fisheries constitute direct take fisheries, which cannot be authorized through section 7. These proposed direct take fisheries are therefore not considered as part of this consultation (Dygert 2001).

With the promulgation of the tribal 4(d) rule (65 FR 42481; July 10, 2000), the tribes now have an alternative review mechanism for considering the merits of proposed tribal fisheries directed at threatened spring/summer chinook. The NPT submitted a Tribal Resource Management Plan (TRMP) for authorization of a direct take fishery in the Imnaha River targeting surplus listed hatchery spring chinook. The SBT submitted a draft TRMP for authorization of a direct take fishery in the wild/natural production area above the SFSR weir (referred to as Stolle Meadows). The final determination on the Imnaha fishery is pending, and the fishery was allowed to begin on June 1, 2001. NMFS is waiting for the final TRMP from the SBT to be submitted. It is not clear at this point if the SBT TRMP for the Stolle Meadows fishery will lead to an authorized fishery this year.

## 1.4 Description of Proposed Fisheries

For purposes of this Biological Opinion, the SRB fisheries have been grouped into six separate geographic units: 1) Mainstem Snake River from the mouth to Hells Canyon Dam; 2) Tucannon River Subbasin; 3) Clearwater River Subbasin; 4) Salmon River Subbasin; 5) Grande Ronde River Subbasin, and 6) Imnaha River Subbasin. Fisheries on the Salmon River are further divided to include those on the Rapid and Little Salmon rivers, SFSR, and Upper Salmon River. The fisheries described below are summarized in Table 1. Only those fisheries considered in this opinion are described below.

### 1.4.1 Unit 1: Mainstem Snake River to Hells Canyon Dam

*Treaty Indian fisheries:*
The NPT propose a ceremonial fishery targeting non-listed hatchery-origin spring/summer chinook to harvest up to 1,045 hatchery-origin spring/summer chinook in this section of the SR in 2001. The predicted return of hatchery-origin chinook past this site would be 40,955 adults. Of these, 3,213 (7.9%) are expected to be listed Imnaha River hatchery returns (which are not distinguishable from any other hatchery fish), 3,746 (9.2%) are Grande Ronde wild/natural returns, and the expected wild/natural return to the Salmon River subbasin is 8,331 (20.3%). The targeted fishery will be in the vicinity of the historic tribal fishing site near Captain Johns Rapids. The areas open will include the Snake River from its confluence with the Clearwater River, upstream to Hells Canyon Dam. This fishery generally occurs from May through July depending on migration timing, with closures regulated inseason. Seasons will be closed when the target harvest level is reached. Permitted gear include dipnet, hoopnet, paddle net and hook and line.

The SBT propose to harvest spring/summer chinook salmon in the unoccupied land areas of the mainstem SR and its tributaries in the area below Hells Canyon Dam in 2001. The Tribes propose to harvest 53 spring/summer chinook of which one would be wild chinook as the 2001 harvest guideline for Unit 1 (2.5% rate applied to 2,067 hatchery unlisted fish and 22 listed wild/natural fish returning to the Oxbow Hatchery weir). These fisheries also generally occur from May - July depending on run timing. Closures are regulated inseason once target harvest levels are reached.

Table 1. Fisheries proposed for 2001 in the Snake River Basin described in the May 5, 2001 Biological Assessment. Those shown in bold constitute direct take fisheries, which are not considered as part of this consultation.

| Geographic Unit/Fishery | Dates of fishery | Managing Government† |
|---|---|---|
| Snake River Mainstem | | |
| Spring/summer chinook | May - June | SBT and NPT |
| Tucannon River Subbasin | | |
| **Tucannon spring chinook** | **May - July** | **NPT/CTUIR** |
| Clearwater River Subbasin | | |
| Clearwater River Basin spring chinook | May 20 - June 20 | NPT and SBT |
| Clear Creek spring chinook | May - Mid-June | NPT |
| Crooked River/Red River spring chinook | May - July | NPT |
| Lochsa spring chinook | May - July | NPT |
| Selway spring chinook | May - July | NPT |
| Salmon River Subbasin | | |
| Rapid River Basin spring chinook | May - June | NPT and SBT |
| South Fork Salmon River spring/summer chinook | June/July - August | NPT and SBT |
| **Upper Salmon River spring/summer chinook** | **June - August** | **SBT** |
| **Salmon River spring/summer wild production areas** | **June - December** | **SBT** |
| Grande Ronde River Subbasin | | |
| Non-Indian Lookingglass spring chinook | May - June | ODFW |
| Tribal Lookingglass spring chinook | June - December | NPT/CTUIR |
| **Grande Ronde River spring/summer chinook** | **June - December** | **SBT** |
| Imnaha River Subbasin | | |
| **Imnaha River spring/summer chinook** | **June - July** | **NPT and SBT** |

† ODFW: Oregon Department of Fish and Wildlife; NPT: Nez Perce Tribe; CTUIR: Confederated Tribes of the Umatilla Indian Reservation; SBT: Shoshone-Bannock Tribes.

Table 2. Projected 2001 returns of spring/summer chinook salmon to hatchery and terminal areas in the Snake River Basin, and estimated proportions of those returns listed under the Endangered Species Act.

| | Projected Hatchery-origin Return | | | Projected Naturally-produced Return | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Subbasin/Fishery Area | Total [a] | Listed | % Listed | Total | Listed | % Listed | Listed | Unlisted | % listed |
| **Snake River mainstem** | | | | | | | | | |
| Oxbow Hatchery | 2067 | 0 | 0% | 22 | 22 | 100% | 22 | 2,067 | 1.1% |
| **Salmon River Subbasin** | | | | | | | | | |
| Little Salmon/Rapid River | 23,318 | 0 | 0% | 597 | 597 | 100% | 597 | 23,318 | 2.5% |
| South Fork (mainstem)[b] | 8,572 | 1,235 | 14% | 2,566 | 2,566 | 100% | 3,801 | 7,337 | 34.1% |
| Pahsimeroi Hatchery | 382 | 382 | 100% | 78 | 78 | 100% | 460 | 0 | 100.0% |
| Sawtooth Hatchery | 1,093 | 1,093 | 100% | 732 | 732 | 100% | 1,825 | 0 | 100.0% |
| Upper Salmon | 0 | 0 | 100% | 843 | 843 | 100% | 843 | 0 | 100.0% |
| **Total Hatchery-origin** | **33,365** | **2,710** | **8%** | — | — | — | — | — | — |
| Natural-origin to other areas | — | — | — | 3,089 | 3,089 | 100% | 3,089 | 0 | 100.0% |
| **Total Natural-origin** | — | — | — | **7,905** | **7,905** | **100%** | — | — | — |
| **Tucannon River** | 125 | 125 | 100% | 125 | 125 | 100% | 250 | 0 | 100.0% |
| **Clearwater River Subbasin** | | | | | | | | | |
| Red River & Crooked Rivers | 3,976 | 0 | 0% | 232 | 0 | 0% | 0 | 4,208 | 0.0% |
| Powell Rack | 5,359 | 0 | 0% | 235 | 0 | 0% | 0 | 5,594 | 0.0% |
| Dworshak Hatchery | 6,663 | 0 | 0% | 0 | 0 | 0% | 0 | 6,663 | 0.0% |
| Kooskia Hatchery | 5,841 | 0 | 0% | 0 | 0 | 0% | 0 | 5,841 | 0.0% |
| **Total Hatchery** | **21,839** | **0** | **0%** | — | — | — | — | — | — |
| Natural-origin in other areas | — | — | — | 1,727 | 0 | 0% | 0 | 1,727 | 0.0% |
| **Grande Ronde River Subbasin** | | | | | | | | | |
| Lookingglass Creek | 1,795 | 0 | 0% | 49 | 0 | 0% | 0 | 1,844 | 0.0% |
| Naturally-produced (excl. Lookingglass Crk.) | 515 | 515 | 100% | 3,697 | 3,697 | 100% | 4,212 | 0 | 100.0% |
| **Imnaha River** | 3,213 | 3,213 | 100% | 3,518 | 3,518 | 100% | 6,731 | 0 | 100.0% |
| **Hatchery-origin returns** | **62,919** | **6,563** | **10%** | | | | | | |
| **Naturally-produced returns** | | | | **22,326** | **20,083** | **90%** | | | |
| **Hatchery/natural Combined** | | | | | | | **21,830** | **58,599** | **27%** |

[a] The percentage listed for each hatchery's return is developed from projections provided by the appropriate co-managers. This percentage is applied to the return projections developed by TAC ( LeFleur 2001a).

[b] Assumes return to spawning areas downstream of the McCall Hatchery weir is same as naturally-produced return to the weir, based on past years' redd count information (available from IDFG).

### 1.4.2 Unit 3: Clearwater River Subbasin

*Treaty Indian fisheries:*
The SBT propose a C&S fisheries for spring chinook salmon in unoccupied land areas of the Clearwater River Subbasin. The SBT propose to harvest 2.5% percent of the estimated return of non-listed Clearwater River hatchery-origin and non-listed natural-origin spring chinook salmon as the 2001 harvest guideline. These fisheries generally occur from May - June depending on run timing.

The NPT propose a C&S hook and line fishery for surplus Dworshak National Fish Hatchery (DNFH) spring chinook salmon in the North Fork Clearwater River, between the mouth and Dworshak Dam. The fishery will occur between May and July, prior to the arrival of fall chinook, with specific dates to be set by the Tribe. The fishery will be managed to take up to 2,645 surplus unlisted hatchery-origin spring chinook for tribal subsistence (50% of the projected surplus return to Dworshak Hatchery). All traditional gear is permitted.

The NPT also propose C&S fisheries for spring chinook salmon in Clear Creek (a tributary to the Middle Fork Clearwater River near the confluence with the South Fork Clearwater River), in Crooked River/Red River, in the Lochsa River, and the Selway River. Each of these fisheries targets non-listed hatchery-origin fish returning to hatcheries on those tributaries. The Clear Creek fishery, targeting returns to Kooskia National Fish Hatchery, will take place between Mid-April through July, taking up to 2,619 spring chinook salmon. The Crooked River fishery, targeting fish returning to the Crooked River facility, will likely occur during the same time period, limited to a take of 1,649 spring chinook salmon. The Lochsa River fishery will occur during June and July, between the confluence of the Lochsa and Selway Rivers upstream to Three Forks. This fishery targets hatchery-origin spring chinook salmon returning to the Powell facility. The NPT propose to take up to 50 % (2,422 fish) of the 4,844 fish surplus to broodstock needs. The Selway River fishery is limited to harvest 100 (non-listed) natural-origin spring/summer chinook and will occur from May through July, from one mile below Selway Falls upstream to Meadow Creek; closures will be regulated inseason. Seasons will be closed when the target harvest level is reached. Fishing gear for these four areas will be gaff, dipnet, longbow, and hook and line.

There is no anticipated take of any listed fish in the proposed Clearwater River Subbasin from Treaty Indian fisheries. Clearwater River spring chinook are not listed under the ESA. SR sockeye and SR fall chinook salmon are generally not present at this time of year and do not enter or pass through the Clearwater Subbasin.

### 1.4.3 Unit 4: Salmon River Subbasin

*Treaty Indian fisheries:*
The proposed tribal fisheries considered in this opinion include those in Rapid River and the SFSR. These fisheries are described below.

#### 1.4.3.1 Rapid River

Rapid River is a tributary to the Little Salmon River. A small number of natural-origin summer chinook salmon return to Rapid River from late June through September. A similar number of unmarked spring chinook salmon also return to the Little Salmon River Basin, although it is believed that these fish are of Rapid River origin, as no spring chinook salmon of natural origin are known to have existed in Little Salmon River historically (IDFG 1997).

Tribal fisheries have been proposed for 2001 that target hatchery-origin spring chinook salmon returning to the Rapid River Hatchery. The NPT has proposed a 2001 spring chinook fishery in the Little Salmon and Rapid rivers for a harvest which would take 10,170 hatchery and 36 wild/natural chinook for tribal subsistence. This take would represent 43.6% of the predicted hatchery and 4.4% of wild returns. The fishing area for the Little Salmon River is from the Salmon River Bridge upstream of the Salmon River confluence. The fishing boundaries for Rapid River are from the confluence upstream to 60 feet downstream of the trap entrance. Effort and catch are distributed in Rapid River from the trap entrance to the confluence with the Little Salmon. Dates for the fishery will be from May through July; closures will be regulated inseason. Initially, fishing will be open to all traditional gear including gaff, dipnet, hoopnet, spear, long bow and hook and line. If the take of wild fish reaches 29 fish (80% of the 36 fish harvest ceiling) before the hatchery target take is reached, the fishery will be restricted to preclude the harvest of additional wild fish. This may be accomplished by season closure or by restriction of gear type to dipnet only with catch and release of wild fish.

The SBT propose 2001 fisheries for spring chinook in the Little Salmon River, from the mouth of Rapid River downstream to the Salmon River Road Bridge at Riggins, Idaho. The SBT propose to harvest a total of 583 chinook with an associated incidental take of 15 listed wild fish. Fisheries generally occur from mid-May through June, but may close earlier if significant numbers of natural-origin summer chinook arrive at the hatchery weir.

Because of migration timing and location, the tribal spring chinook fisheries in Rapid and Little Salmon rivers will have no effect on SR sockeye, SR fall chinook salmon, or SR steelhead.

#### 1.4.3.2 South Fork Salmon River

The 2001 prediction for the SFSR weir is 11,138 and will be comprised of 7,337 hatchery-origin unlisted chinook and 3,801 listed SR spring/summer chinook (2,566 natural-origin chinook, 1,235 hatchery-origin listed chinook), while an estimated 500 listed fish would also return to spawn downstream of the weir (per co-managers conference of 5/29/01). The NPT propose to target half of the projected hatchery return, or 3,668 fish. The initial fishery would be indiscriminate in utilizing all traditional gear types. Based on proportion of listed fish to unlisted fish, this fishery would result in the indirect take of 200 fish while targeting 342 hatchery returns. This would be the trigger to restrict gear to dipnet only to target the remaining 3,326 hatchery-origin fish. All wild and hatchery listed fish caught are to be released. A handle rate of 1,945

listed fish is projected to occur while targeting the remaining allocated amount. Therefore, the dipnet fishery would have a catch-and-release mortality (1%) of an additional 19 listed chinook. Total impacts of the proposed NPT fishery in the SFSR would be 219 (5% of the run) listed fish. The projected returns on which harvest rates are based are subject to update inseason. Areas open to fishing include the SFSR from 100 feet below the weir (RM 72) downstream to the confluence with the East Fork South Fork.

The SBT propose a 2001 spring/summer chinook subsistence fishery in the SFSR to target non-listed, adipose fin-clipped hatchery-origin chinook. The location of the proposed fishery is from 100 feet below the SFSR weir (RM 72) to the confluence with the East Fork SFSR (RM 46). The SBT propose a harvest guideline on listed fish of 380 fish which is 10 percent of the projected 3,801 listed fish return. For the SFSR fishery targeting hatchery fish below the weir, the SBT propose a total harvest of 3,455 adult fish, of which no more than 380 would be listed. The SBT's fisheries will be curtailed once either the total fish or listed fish harvest guidelines in the SFSR are reached, or when salmon are observed spawning until the spawning is completed, whichever occurs first. The fishery will occur between mid-June and August 22, 2001. The curtailment date corresponds with the SBT's intent that this fishery will target hatchery-origin fish returning to hatchery release areas. Therefore, the fisheries will be conducted while chinook are still actively migrating to the hatchery release areas. The projected returns on which harvest rates are based are subject to update inseason.

Although Idaho State fisheries are not subject to consultation in this biological opinion, impacts associated with Idaho's summer chinook recreational fishery in the SFSR are relevant to the analysis in this opinion. Idaho proposes to conduct a recreational fishery for summer chinook salmon on the upper SFSR, similar to the sport fisheries in 1997 and 2000. Idaho requests an authorization for lethal take of 144 adult, ESA listed summer chinook in the proposed fishery (due to catch and release of 1440 listed adults). It is estimated that 994 natural-origin and 446 hatchery-origin listed summer chinook salmon will be handled in Idaho's SFSR recreational fishery, based on run reconstruction expectation. The combination of proposed tribal and state fisheries will result in the take of 743 listed spring/summer chinook salmon or 17.3% of the expected return.

### 1.4.4 Unit 5: Grande Ronde River Subbasin

The allocation of catch between the State of Oregon and the tribes will be reached by the parties.

*Treaty Indian fisheries:*
The NPT and CTUIR propose joint tribal C&S spring chinook salmon fishery in Lookingglass Creek, in the lower 1½ miles from the mouth to the hatchery weir. This fishery will likely take place between mid-June and mid-July. Allowable gear includes gaff, dipnet, spear, and hook-and-line. The NPT and CTUIR propose to harvest 859 non-listed Lookingglass Hatchery spring chinook salmon returning to the hatchery weir.

As described earlier, the SBT chinook salmon fisheries in the Grande Ronde River Subbasin in 2001 would constitute direct take fisheries and are not considered in this opinion.

*Non-Indian recreational fisheries:*
Oregon proposed a recreational fishery on Lookingglass Hatchery Rapid River stock spring chinook returning to Lookingglass Creek in 2001. The non-Indian recreational fishery is expected to harvest up to 600 hatchery fish. Non-Indian recreational fisheries generally occur in May and June.

## 2.0 STATUS OF THE SPECIES AND CRITICAL HABITAT

Four salmonid Evolutionary Significant Units (ESUs) listed under the ESA are present in the action area. SR sockeye (*O. nerka*) are listed as endangered, SR spring/summer and SR fall chinook salmon and SR steelhead are listed as threatened. Of the four listed ESUs in the basin, only SR spring/summer chinook will be affected by the proposed fisheries. The substantive elements of the following discussion regarding species status therefore focuses on SR spring/summer chinook. A discussion about the status of SR fall chinook and steelhead can be found in the NMFS Biological Opinion on 2000 Fall Season Fisheries (NMFS 2000b). A discussion of the status of SR sockeye salmon can be found in the All Species Review prepared by the U.S. v Oregon Technical Advisory Committee (TAC 1997).

### 2.1 Species Descriptions and Critical Habitat Designations

#### 2.1.1 Chinook Salmon

##### 2.1.1.1 Snake River Spring/Summer Chinook Salmon

The SR spring/summer chinook salmon ESU, listed as threatened on April 22, 1992 (57 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon rivers. Some or all of the fish returning to several of the hatchery programs are also listed, including those returning to the Tucannon River, Imnaha, and Grande Ronde hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River. Critical habitat was designated for SR spring/summer chinook salmon on December 28, 1993 (58 FR 68543) and was revised on October 25, 1999 (64 FR 57399).

### 2.2 General Life Histories

#### 2.2.1 Chinook Salmon

The chinook salmon is the largest of the Pacific salmon. The species' distribution historically ranged from the Ventura River in California to Point Hope, Alaska, in North America, and in northeastern Asia from Hokkaido, Japan, to the Anadyr River in Russia (Healey 1991). Additionally, chinook salmon have been reported in the Mackenzie River area of northern

Canada (McPhail and Lindsey 1970). Of the Pacific salmon, chinook salmon exhibit the most diverse and complex life history strategies. Healey (1986) described 16 age categories for chinook salmon, combinations of seven total ages with three possible freshwater ages. This level of complexity is roughly comparable to that seen in sockeye salmon (*O. nerka*), although the latter species has a more extended freshwater residence period and uses different freshwater habitats (Miller and Brannon 1982, Burgner 1991). Gilbert (1912) initially described two generalized freshwater life-history types: "stream-type" chinook salmon, which reside in freshwater for a year or more following emergence, and "ocean-type" chinook salmon, which migrate to the ocean within their first year. Healey (1983, 1991) has promoted the use of broader definitions for ocean-type and stream-type to describe two distinct races of chinook salmon. Healey's approach incorporates life history traits, geographic distribution, and genetic differentiation and provides a valuable frame of reference for comparisons of chinook salmon populations.

The generalized life history of Pacific salmon involves incubation, hatching, and emergence in freshwater; migration to the ocean; and the subsequent initiation of maturation and return to freshwater for completion of maturation and spawning. The juvenile rearing period in freshwater can be minimal or extended. Additionally, some male chinook salmon mature in freshwater, thereby foregoing emigration to the ocean. The timing and duration of each of these stages is related to genetic and environmental determinants and their interactions to varying degrees. Although salmon exhibit a high degree of variability in life-history traits, there is considerable debate regarding the degree to which this variability is shaped by local adaptation or results from the general plasticity of the salmonid genome (Ricker 1972, Healey 1991, Taylor 1991). More detailed descriptions of the key features of chinook salmon life history can be found in Myers et al. (1998) and Healey (1991).

## 2.3 Population Dynamics and Distribution

### 2.3.1 Chinook Salmon

#### 2.3.1.1 Snake River Spring/Summer Chinook Salmon

The present range of spawning and rearing habitat for naturally-spawned SR spring/summer chinook salmon is primarily limited to the Grande Ronde, Salmon, Imnaha, and Tucannon Subbasins. Historic populations in the Clearwater Basin were extirpated; spring summer chinook population in the Clearwater were not included as part of the listed ESU. Most SR spring/summer chinook salmon enter individual subbasins from May through September. Juvenile SR spring/summer chinook salmon emerge from spawning gravels from February through June (Perry and Bjornn 1991). Typically, after rearing in their nursery streams for about one year, smolts begin migrating seaward in April and May (Bugert *et al*. 1990; Cannamela 1992). After reaching the mouth of the Columbia River, spring/summer chinook salmon probably inhabit nearshore areas before beginning their northeast Pacific Ocean migration, which lasts two to three years. Because of their timing and ocean distribution, these stocks are subject to very little ocean harvest. For detailed information on the life history and stock status of SR

spring/summer chinook salmon, see Matthews and Waples (1991), NMFS (1991), and 56 FR 29542 (June 27, 1991).

Bevan *et al*. (1994) estimated the number of natural-origin adult SR spring/summer chinook salmon in the late 1800s to be more than 1.5 million fish annually. By the 1950s, the population had declined to an estimated 125,000 adults. Escapement estimates indicate that the population continued to decline through the 1970s. Returns were variable through the 1980s, but declined further in recent years. Record low returns were observed in 1994 and 1995. Dam counts were modestly higher from 1996-1998, but declined in 1999. For management purposes the spring and summer chinook in the Columbia Basin, including those returning to the SRB, have been managed as separate stocks. Historic databases therefore provide separate estimates for the spring and summer chinook components. Table 3 provides the estimated annual return of adult, natural-origin SRB spring and summer chinook salmon returning to Lower Granite Dam since 1979. A preliminary recovery escapement goal for SR spring/summer chinook of 31,440 (counted at Ice Harbor Dam) was suggested in NMFS' Proposed Recovery Plan (NMFS 1995b).

The SR spring/summer chinook salmon ESU consists of 39 local spawning populations (subpopulations) spread over a large geographic area (Lichatowich *et al*. 1993). The number of fish returning to Lower Granite Dam is therefore divided among these subpopulations. The relationship between these subpopulations, and particularly the degree to which straying may occur between these is unknown. It is unlikely that these are all "populations" as defined by McElhany et. al (1999) which requires that they be isolated to the extent that the exchange of individuals among the populations does not substantially affect the population dynamics or extinction risk over a 100-year time frame. Nonetheless, monitoring the status of the subpopulations provides a more detailed indicator of the species' status than does the general measure of aggregate abundance.

Seven of these subpopulations have been used as index stocks for the purpose of analyzing extinction risk and alternative actions that may be taken to meet survival and recovery requirements. These were selected primarily on the basis of the availability of long time series of abundance information. Recovery and threshold abundance levels have been developed for the index stocks and serve as reference points for comparison to observed escapements (Table 4). They have also been used for assessment purposes in the PATH (Plan for Analyzing and Testing Hypotheses) process. The recovery levels are abundance-related delisting objectives (C. Toole, NMFS, pers. comm., w/ P. Dygert, NMFS, January 21, 2000). The threshold levels were developed by the Biological Requirements Work Group (BRWG 1994) and represent levels at which uncertainties about processes or population enumeration are likely to become significant , and at which qualitative changes in processes are likely to occur. They were specifically not developed as an indicator of pseudo-extinction or as an absolute indicator of a "critical" threshold. Escapement estimates for the index stocks have generally been well below threshold levels in recent years (Table 4).

Table 3. Estimates of natural-origin Snake River spring/summer chinook salmon counted at Lower Granite Dam in recent years.

| Year | Spring Chinook | Summer Chinook | Total |
|---|---|---|---|
| 1979 | 2,573 | 2,714 | 5,285 |
| 1980 | 3,478 | 2,404 | 6,166 |
| 1981 | 7,941 | 2,739 | 11,267 |
| 1982 | 7,117 | 3,531 | 10,646 |
| 1983 | 6,181 | 3,219 | 9,414 |
| 1984 | 3,799 | 4,229 | 7,399 |
| 1985 | 5,245 | 2,696 | 7,941 |
| 1986 | 6,895 | 2,684 | 9,579 |
| 1987 | 7,883 | 1,855 | 9,738 |
| 1988 | 8,581 | 1,807 | 10,388 |
| 1989 | 3,029 | 2,299 | 5,328 |
| 1990 | 3,216 | 3,342 | 6,558 |
| 1991 | 2,206 | 2,967 | 5,173 |
| 1992 | 11,134 | 441 | 11,575 |
| 1993 | 5,871 | 4,082 | 9,953 |
| 1994 | 1,416 | 183 | 1,599 |
| 1995 | 745 | 343 | 1,088 |
| 1996 | 1,358 | 1,916 | 3,274 |
| 1997 | 2,126 | 5,137 | 7,263 |
| 1998 | 5,089 | 2,913 | 8,002 |
| 1999 | 1,335 | 1,584 | 3,276 |
| 2000 | 8,049 | 846 | 8,895 |
| ***2001Forecast*** | 17,700 | 2,400 | 20,100 |
| Recovery Escapement Level (counted at Ice Harbor) | | | 31,440 |

Table 4. Adult spawners for Snake River Spring/Summer chinook index stocks. Bear Valley, Marsh, Sulphur and Minam are spring chinook index stocks. Poverty Flats and Johnson are summer run index chinook stocks. Imnaha has an intermediate run timing. The 2001 returns are based on the preseason forecast

| Brood year | Bear Valley | Marsh | Sulphur | Minam | Imnaha | Poverty Flats | Johnson |
|---|---|---|---|---|---|---|---|
| 1979 | 215 | 83 | 90 | 40 | 238 | 76 | 66 |
| 1980 | 42 | 16 | 12 | 43 | 183 | 163 | 55 |
| 1981 | 151 | 115 | 43 | 50 | 453 | 187 | 102 |
| 1982 | 83 | 71 | 17 | 104 | 590 | 192 | 93 |
| 1983 | 171 | 60 | 49 | 103 | 435 | 337 | 152 |
| 1984 | 137 | 100 | 0 | 101 | 557 | 220 | 36 |
| 1985 | 295 | 196 | 62 | 625 | 699 | 341 | 178 |
| 1986 | 224 | 171 | 385 | 357 | 479 | 233 | 129 |
| 1987 | 456 | 268 | 67 | 569 | 448 | 554 | 175 |
| 1988 | 1109 | 395 | 607 | 493 | 606 | 844 | 332 |
| 1989 | 91 | 80 | 43 | 197 | 203 | 261 | 103 |
| 1990 | 185 | 101 | 170 | 331 | 173 | 572 | 141 |
| 1991 | 181 | 72 | 213 | 189 | 251 | 538 | 151 |
| 1992 | 173 | 114 | 21 | 102 | 363 | 578 | 180 |
| 1993 | 709 | 216 | 263 | 267 | 1178 | 866 | 357 |
| 1994 | 33 | 9 | 0 | 22 | 115 | 209 | 50 |
| 1995 | 16 | 0 | 4 | 45 | 97 | 81 | 20 |
| 1996 | 56 | 18 | 23 | 233 | 219 | 135 | 49 |
| 1997 | 225 | 110 | 43 | 140 | 474 | 363 | 236 |
| 1998 | 372 | 164 | 140 | 122 | 159 | 396 | 119 |
| 1999 | 72 | 0 | 0 | 96 | 282 | 153 | 49 |
| 2000 | 313 | 65 | 13 | na | na | 350 | 63 |
| **Recovery Levels** | **900** | **450** | **300** | **450** | **850** | **850** | **300** |
| **BRWG Threshold** | **300** | **150** | **150** | **150** | **300** | **300** | **150** |

The preliminary total number of Columbia River mouth upriver spring chinook for 2001 is 418,000 adults, substantially above the preseason projection of 364,600. This is the largest return since counts began in 1937 and is nearly five times the recent 5-year average. The expected return of SR spring chinook is 206,700 which is over six times the recent 5-year average. About 20% of the run will be listed natural-origin spring chinook, but the forecast return (39,300) is nonetheless nearly six times the average of recent years and eight to ten times higher than the returns in the contributing brood years (3,900 and 4,800 in 1996 and 1997, respectively).

Projected preseason Lower Granite Dam counts and SR tributary returns of spring and summer chinook in 2001 are presented in Appendix 1. The substantial return of hatchery-origin fish will provide opportunities to pursue supplementation options designed to help rebuild natural-origin populations subject to constraints related to population diversity and integrity. For example, expected returns to the Imnaha River ( 3,518 natural-origin and 3,213 listed hatchery-origin fish), and Sawtooth Hatchery (1,093 listed hatchery-origin fish and 732 natural-origin fish) all represent substantial increases over past years and provide opportunities for supplementation in the local basins designed to help rebuild the natural-origin stocks. The forecast return of hatchery-origin fish to the Tucannon River is 250 listed hatchery-origin and natural-origin fish.

The 2001 forecast for the upriver summer chinook stocks to the Columbia River mouth is 24,500 which compares to the average return over the last 30 years (23,600), and only a small portion (3,100) are natural-origin fish destined for the SR. The expected return of 2,352 natural-origin summer chinook to Lower Granite Dam in 2001 is somewhat lower than brood year escapements in 1996 and 1997 of 1,916 and 5,137 and compares to the average returns over the last five years (2,480). The 2000 Columbia River mouth return was 30,651.

The probability of meeting survival and recovery objectives for SR spring/summer chinook salmon under various future operation scenarios for the hydrosystem was analyzed through a process referred to as PATH (Plan for Analyzing and Testing Hypotheses) (Marmorek et al. 1998) The scenarios analyzed focused on status quo management and options that emphasized either juvenile transportation or hydro-project drawdown. PATH also included sensitivity analyses to alternative harvest rates and habitat effects. PATH estimated the probability of survival and recovery for the seven index stocks using the recovery and escapement threshold levels as abundance indicators. The forward simulations estimated the probability of meeting the survival thresholds after 24 and 100 years.

A 70% probability of exceeding the threshold escapement levels was used to assess survival. Recovery potential was assessed by comparing the projected abundance to the recovery abundance levels after 48 years. A 50% probability of exceeding the recovery abundance levels was used to evaluate recovery by comparing the 8-year mean projected abundance. In general, the survival and recovery standards were met for operational scenarios involving drawdown, but were not met under status quo management or for the scenarios that relied on juvenile transportation (Marmorek et al. 1998). If the most conservative harvest rate schedule was assumed, transportation scenarios came very close to meeting the survival and recovery standards.

More recent analyses, generally referred to as the Cumulative Risk Initiative (CRI), have been developed by the NMFS' Northwest Regional Science Center. The CRI is designed to provide a standardize tool for assessing stock status and survival improvement necessary to meet survival and recovery objectives. For the SR spring/summer chinook salmon ESU as a whole, NMFS

estimates that the median population growth rate (lambda) over the base period[1] ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to the effectiveness of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000a). NMFS has also estimated median population growth rates and the risk of absolute extinction for the seven spring/summer chinook salmon index stocks,[2] using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years for the wild component ranges from zero for Johnson Creek to 0.78 for the Imnaha River (Table B-5 in McClure et al. 2000a). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years ranges from zero for Johnson Creek to 1.00 for the wild component in the Imnaha River (Table B-6 in McClure et al. 2000a).

In its recent biological opinion regarding the FCRPS, NMFS summarized the prospects for survival and recovery in terms of the estimated percent change in survival needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements of the Reasonable and Prudent Alternative (NMFS 2000c). These are then identified as the offsite mitigation performance standards for the FCRPS (see section 9.2.2.2.2 in NMFS 2000c). In general, the low and high values in the table reflect uncertainty about the effectiveness of hatchery spawners in the wild, although the summary statistics do not reflect the full measure of uncertainty in the estimates. These estimates suggest that three of the seven SR spring/summer chinook index stocks require no additional survival changes beyond those expected through modification of the hydrosystem under the RPA to meet the survival and recovery indicator criteria. The other four index stocks require additional survival improvements ranging from 0 to 66% (Table 5). These survival improvements are expected to be achieved through offsite mitigation activities. Inherent in the overall analysis is the assumption that harvest impacts will remain at the levels reflected in the most recent biological opinions. Generally speaking, increases in the harvest rates, particularly over the long-term, will change these statistics and increase the level of survival improvements required in other sectors. Harvest increases, beyond those assumed, would otherwise simply reflect a further increase of risk to the species.

[1]Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1999 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

[2] McClure et al. (2000b) have calculated population trend parameters for additional SR spring/summer chinook salmon stocks.

Table 5. Estimated percentage change (i.e., additional improvement in life-cycle survival) needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements in the RPA. (A value of 26, for example, indicates that the egg-to-adult survival rate, or any constituent life-stage survival rate, must be multiplied by a factor of 1.26 to meet the indicator criteria.)

| Spawning Aggregation | Needed survival Change | |
|---|---|---|
| | Low | High |
| **Snake River Spring/Summer** | | |
| Bear Valley/Elk Creeks | 0 | 0 |
| Imnaha River | 26 | 66 |
| Johnson Creek | 0 | 0 |
| Marsh Creek | 0 | 12 |
| Minam River | 0 | 28 |
| Poverty Flats | 0 | 0 |
| Sulphur Creek | 0 | 5 |
| **Upper Columbia River Spring** | | |
| Methow River | 24 | 90 |
| Entiat River | 32 | 119 |
| Wenatchee River | 51 | 178 |

Note: Low and High estimates are based on a range of assumptions, as described in the text.

## 3.0 ENVIRONMENTAL BASELINE

The purpose of this section is to identify "the past and present effects of all Federal, State, or private activities in the action area, the anticipated effects of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the effect of State or private actions which are contemporaneous with the consultation in process" (50 CFR § 402.02, definition of *effects of the action*). These factors affect the species' environment or critical habitat in the action area. The factors are described in relation to the action area biological requirements of the species.

In addition to harvest activities, the activities having the greatest effect on the environmental

baseline generally fall into four categories: hydropower system impacts on juvenile out-migration and adult return migration; habitat degradation effects on water quality and availability of adequate incubation and rearing locations; adverse genetic and competitive impacts from artificial production programs; and fluctuations in natural conditions.

## 3.1 Description of Action Area

The action area relative to adult SR basin salmonids is the part of their habitat that is affected by the proposed treaty-Indian and non-Indian fisheries in the SR, as described in the biological assessment (LeFleur 2001a) and subsequent addendums (LeFleur 2001b, Kutchins 2001a, Kutchins 2001b, Oatman 2001).

## 3.2 Biological Requirements in Action Area

Of the four listed salmonid ESUs present in the SRB only spring/summer chinook salmon are affected by the proposed fisheries considered in this opinion. Biological requirements during the adult life history stage are obtained through access to essential features of critical habitat. Essential features include adequate 1) substrate (especially spawning gravel), 2) water quality, 3) water quantity, 4) water temperature, 5) water velocity, 6) cover/shelter, 7) food, 8) riparian vegetation, 9) space, and 10) migration conditions (58 FR 68546 for SR salmon and 65 FR 773 for all other Columbia River basin salmonids). These features are nearly identical to those characterized as Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (PFMC 1999).

### 3.2.1 Essential Features of Critical Habitat in Action Area

The sections below describe essential features of critical habitat for each of the relevant habitat types: 1) adult migration corridors, and 2) spawning areas in the action area discussed in the following sections.

Adult Migration Corridors
Essential features of critical habitat for adult migration corridors include all the essential features of critical habitat except for adequate food.

Spawning Areas
Essential features of critical habitat for spawning areas include all the essential features of critical habitat with the exception of adequate food.

### 3.2.2 Adequacy of Habitat Conditions in Critical Habitat

Regulations implementing Section 7(a)(2) of the ESA define "destruction or adverse modification" as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species". Adverse effects on a constituent

element of critical habitat generally do not result in a determination of "adverse modification" unless that loss, when added to the environmental baseline, is likely to result in an appreciable diminishment of the value of the critical habitat for both the survival and the recovery of the listed species (50 CFR Section 402.02).

Quantitatively defining a level of adequacy through specific, measurable standards is difficult for many of these biological requirements. In many cases, the absolute relationship between the critical element and species survival is not clearly understood, thus limiting development of specific, measurable standards. In contrast, some parameters are generally well known in the fisheries literature (e.g., thermal tolerances). For the remaining action-area biological requirements, the effects of any adverse impacts on essential features of critical habitat are considered in more qualitative terms.

## 3.3 Factors Affecting Species' Environment in Action Area

### 3.3.1 Hydrosystem Effects

Columbia River basin anadromous salmonids, especially those above Bonneville Dam, have been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated spawning and rearing habitat and have altered the natural hydrograph of the Snake and Columbia rivers, decreasing spring and summer flows and increasing fall and winter flows. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs and riparian ecology and stranding fish in shallow areas. The eight dams in the migration corridor of the Snake and Columbia rivers alter smolt and adult migrations. Smolts experience a high level of mortality passing through the dams. The dams also have converted the once-swift river into a series of slow-moving reservoirs, slowing the smolts' journey to the ocean and creating habitat for predators. Water velocities throughout the migration corridor are now far more dependent on volume runoff than before development of the mainstem reservoirs.

There have been numerous changes in the operation and configuration of the FCRPS as a result of ESA consultations between the Action Agencies (Corps of Engineers, Bureau and Bonneville Power Administration) and the services (NMFS and USFWS). The changes have improved survival for the listed fish migrating through the Snake and Columbia rivers. Increased spill at all FCRPS dams allows smolts to avoid both turbine intakes and bypass systems. Increased flow in the mainstem Snake and Columbia rivers provides better inriver conditions for smolts. The transportation of smolts from the SR has also been improved by the addition of new barges and modification of existing barges.

In addition to spill, flow, and transportation improvements, the Corps implemented numerous other improvements to project operations and maintenance at all Columbia and SR dams. These improvements, such as operating turbines at peak efficiency, new extended-length screens at McNary, Little Goose, and Lower Granite dams, and extended operation of bypass screens, are

discussed in greater detail in the 2000 FCRPS Biological Opinion (NMFS 2000c).

It is possible to quantify the survival benefits accruing from these many actions for each of the listed ESUs. For SR spring/summer chinook smolts migrating inriver, the estimated survival through the hydrosystem is now between 40% and 60%, compared with an estimated survival rate during the 1970s of 5% to 40%. SR steelhead have probably received a similar benefit because their life history and run timing are similar to that of spring/summer chinook (NMFS 2000c). It is more difficult to obtain direct data and compare survival improvements for fish transported from the SR, but there are likely to be improvements for transported fish as well. It is reasonable to expect that the improvements in operation and configuration of the FCRPS will benefit all listed Columbia basin salmonids and that the benefits will be greater the farther upriver the ESU. However, further improvements are necessary because the Federal hydrosystem continues to cause a significant level of mortality for some ESUs. NMFS has just recently completed a reinitiated consultation on the FCRPS (NMFS 2000c) and the related all-H paper (Federal Caucus 2000). These provide direction for the future configuration and operation of the FCRPS and a blue print for actions required in other sectors considered necessary for the survival and recovery of listed species.

### 3.3.2 Habitat Effects

The quality and quantity of freshwater habitat in much of the SR basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have radically changed the historical habitat conditions of the basin. With the exception of fall chinook, which generally spawn and rear in the mainstem, salmon and steelhead spawning and rearing habitat is found in tributaries to the SR. Anadromous fish typically spend from a few months to 3 years rearing in freshwater tributaries. Depending on the species, they spend from a few days to 1 or 2 years in the Columbia River estuary before migrating out to the ocean and another 1 to 4 years in the ocean before returning as adults to spawn in their natal streams.

Most of the water bodies in Oregon, Washington, and Idaho that are on the 303(d) list do not meet water quality standards for temperature. Water quality in streams throughout the SRB has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and grazing, road construction, timber harvest activities, mining activities, and urbanization. Temperature alterations affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that result in high stream temperatures are the removal of trees or shrubs that directly shade streams, excessive water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land uses that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a significant cause of habitat degradation and reduced fish production. Hundreds of thousands of acres of land in the basin are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops consume a large proportion. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers.

On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density, which can affect timing and duration of runoff. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have become developed. Urbanization paves over or compacts soil and increases the amount and pattern of runoff reaching rivers and streams.

Many tributaries have been significantly depleted by water diversions. In 1993, fish and wildlife agency, Tribal, and conservation group experts estimated that 80% of 153 Oregon tributaries had low-flow problems (two-thirds caused at least in part by irrigation withdrawals) (Oregon Water Resources Department 1993). The NWPPC showed similar problems in many Idaho, Oregon, and Washington tributaries (NWPPC 1992).

Blockages that stop the downstream and upstream movement of fish exist at many agricultural, hydrosystem, municipal/industrial, and flood control dams and barriers. Highway culverts that are not designed for fish passage also block upstream migration. Migrating fish are diverted into unscreened or inadequately screened water conveyances or turbines, resulting in unnecessary mortality. While many fish-passage improvements have been made in recent years, manmade structures continue to block migrations or kill fish throughout the basin.

Land ownership has played a part in habitat and land use changes. Federal lands are generally forested and influence upstream portions of the watersheds. While there is substantial habitat degradation across all ownerships, in general, habitat in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt et al. 1993, Frissell 1993, Henjum et al. 1994, Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992, Spence et al. 1996, ISG 1996). Today, agricultural and urban land development and water withdrawals have significantly altered the habitat for fish and wildlife. Streams in these areas typically have high

water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

Mainstem habitats of the SR have been affected by impoundments that have inundated large amounts of spawning and rearing habitat. Historically, fall chinook salmon spawned in the SR downstream of Shoshone Falls. Current mainstem production areas for fall chinook are mostly confined to the Hells Canyon Reach of the SR, with minor spawning populations below the lower SR dams. Mainstem habitat in the SR has been reduced, for the most part, to a single channel, floodplains have been reduced in size, off-channel habitat features have been lost or disconnected from the main channel, and the amount of large woody debris (large snags/log structures) in rivers has been reduced. Most of the remaining habitats are affected by flow fluctuations associated with reservoir management.

The Columbia River estuary has also been changed by human activities. Historically, the downstream half of the estuary was a dynamic environment with multiple channels, extensive wetlands, sandbars, and shallow areas. The mouth of the Columbia River was about 4 miles wide. Winter and spring floods, low flows in late summer, large woody debris floating downstream, and a shallow bar at the mouth of the Columbia River kept the environment dynamic. Today, navigation channels have been dredged, deepened and maintained, jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels, marsh and riparian habitats have been filled and diked, and causeways have been constructed across waterways. These actions have decreased the width of the mouth of the Columbia River to 2 miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet. Sand deposition at river mouths has extended the Oregon coastline approximately 4 miles seaward and the Washington coastline approximately 2 miles seaward (Thomas 1981).

More than 50% of the original marshes and spruce swamps in the estuary have been converted to industrial, transportation, recreational, agricultural, or urban uses. More than 3,000 acres of intertidal marsh and spruce swamps have been converted to other uses since 1948 (Lower Columbia River Estuary Program 1999). Many wetlands along the shore in the upper reaches of the estuary have been converted to industrial and agricultural lands after levees and dikes were constructed. Furthermore, water storage and release patterns from reservoirs upstream of the estuary have changed the seasonal pattern and volume of discharge. The peaks of spring/summer floods have been reduced, and the amount of water discharged during winter has increased.

Studies begun in 1997 by the Oregon Cooperative Fish and Wildlife Research Unit, the USGS, and CRITFC have shown that fish-eating birds that nest on islands in the Columbia River estuary (Caspian terns, double-crested cormorants, and glaucous-winged gulls) are significant avian predators of juvenile salmonids. Researchers estimated that the tern population on Rice Island (16,000 birds in 1997) consumed 6 to 25 million outmigrating smolts during 1997 (Roby et al. 1998) and 7 to 15 million during 1998 (Collis et al. 1999). The observed levels of predation prompted the regional fish and wildlife managers to investigate the feasibility of management

actions to reduce the impacts. Early management actions appear to have reduced predation rates; researchers estimate that terns consumed 7.3 million smolts during 1999 (Columbia Basin Bird Research 2000). Because Rice Island is a dredged material disposal site in the Columbia River estuary, created by the Corps under its Columbia River Channel Operation and Maintenance Program, the effects of tern predation on the survival and recovery of listed salmonids are considered in a separate consultation on that program. This factor is considered part of the environmental baseline on effects of the FCRPS.

The All-H Paper outlines a broad range of current habitat programs. Because most of the basin's anadromous fish spawning habitat is in Federal ownership, Federal land management programs are of primary importance. Current management is governed by an ecosystem-based aquatic habitat and riparian-area management strategy known as PACFISH, and associated biological opinions. This interim strategy covers the majority of the basin accessible to anadromous fish and includes specific prescriptions designed to halt habitat degradation.

The All-H Paper also outlines a large number of non-Federal habitat programs. However, because non-Federal habitat is managed predominantly for private rather than public purposes, expectations for non-Federal habitat are harder to assess. Degradation of habitat for listed fish from activities on non-Federal lands is likely to continue to some degree over the next 10 years, although at a reduced rate due to state, Tribal, and local recovery plans.

### 3.3.3 Hatchery Effects

For more than 100 years, hatcheries in the Pacific Northwest have been used to replace natural production lost as a result of the FCRPS and other development, not to protect and rebuild natural populations. As a result, most salmon populations in this region are primarily hatchery fish. In 1987, for example, 95% of the coho, 70% of the spring chinook, 80% of the summer chinook, 50% of the fall chinook, and 70% of the steelhead returning to the Columbia Basin originated in hatcheries (Columbia Basin Fish and Wildlife Authority 1990).

While hatcheries certainly have contributed greatly to the overall numbers of salmon, only recently has the effect of hatcheries on native wild populations been demonstrated. In many cases, these effects have been substantial. For example, production of hatchery fish, among other factors, has contributed to the 90% reduction in wild coho salmon runs in the lower Columbia River over the past 30 years (Flagg et al. 1995). Hatcheries have traditionally focused on providing fish for harvest, with less attention given to identifying and resolving factors causing declines of native runs.

NMFS has identified four primary categories of risk that hatcheries can pose on wild-run salmon and steelhead: 1) ecological effects, 2) genetic effects, 3) overharvest effects, and 4) masking effects (NMFS 2000c). Ecologically, hatchery fish can increase predation on, displace, and/or compete with wild fish. These effects are likely to occur when fish are released in poor condition and do not migrate to marine waters, but rather remain in the streams for extended rearing

periods, during which they may prey on or compete with wild fish. Hatchery fish also may transmit hatchery-borne diseases, and hatcheries themselves may release diseases into streams via water effluents.

Genetically, hatchery fish can affect the genetic variability of native fish via interbreeding, either intentionally or accidentally. Interbreeding can also result from the introduction of native stocks from other areas. Theoretically, interbred fish are less adapted to and productive within the unique local habitats where the original native stock evolved.

In many areas, hatchery fish provide increased fishery opportunities. When wild fish mix with hatchery stock, fishing pressure can lead to overharvest of smaller or weaker wild stocks. Further, when migrating adult hatchery and wild fish mix on the spawning grounds, the health of the wild runs and the condition of the habitat's ability to support runs can be overestimated, because the hatchery fish mask surveyors' ability to discern actual wild run conditions.

NMFS determined that there is a need for immediate hatchery reform and conservation actions (Federal Caucus 2000). Federal agencies will work with the NWPPC to accelerate funding and implementation of the reform measures from the hatchery biological opinions and related actions that should proceed over the next 1 to 3 years. Such reforms will be pursued in the context of the Hatchery and Genetic Management Plans (HGMP). The HGMP is a tool for defining goals and objectives of a particular hatchery, and its relationship to prioritized basin objectives, including harvest opportunities and wild stock performance. Specifically, each HGMP should ensure that genetic broodstock selected is appropriate, that it minimizes the potential for adverse ecological effects on wild populations, and that it is integrated into basinwide strategies to meet objectives of all Hs.

### 3.4 Natural Conditions

Changes in the abundance of salmonid populations are substantially affected by changes in the freshwater and marine environments. For example, large-scale climatic regimes, such as El Niño, affect changes in ocean productivity. Much of the Pacific Coast was subject to a series of very dry years during the first part of the 1990s. In more recent years, severe flooding has adversely affected some stocks. For example, the low return of Lewis River bright fall chinook salmon in 1999 is attributed to flood events during 1995 and 1996.

Chinook salmon are exposed to high rates of natural predation, particularly during freshwater rearing and migration stages. Ocean predation may also contribute to significant natural mortality, although the levels of predation are largely unknown. In general, salmonids are prey for pelagic fishes, birds, and marine mammals, including harbor seals, sea lions, and killer whales. There have been recent concerns that the rebound of seal and sea lion populations, following their protection under the Marine Mammal Protection Act of 1972, has resulted in substantial mortality for salmonids. In recent years, for example, sea lions have learned to target UWR spring chinook salmon in the fish ladder at Willamette Falls. In some locations sea lions

and harbor seals have learned to pull fish trapped in gillnets before they can be landed.

A key factor substantially affecting many West Coast stocks has been the general pattern of a 30-year decline in ocean productivity. The mechanism whereby stocks are affected is not well understood. The pattern of response to these changing ocean conditions has differed among stocks, presumably due to differences in their ocean timing and distribution. It is presumed that survival is driven largely by events occurring between ocean entry and recruitment to a subadult life stage. One indicator of early ocean survival can be computed as a ratio of coded-wire tag (CWT) recoveries of subadults relative to the number of CWTs released from that brood year. Time series of survival rate information for UWR spring chinook, Lewis River fall chinook salmon show highly variable or declining trends in early ocean survival, with very low survival rates in recent years (NMFS 2001a).

Recent evidence suggests that marine survival of salmonids fluctuates in response to 20- to 30-year long periods of either above or below average survival that is driven by long-term cycles of climatic conditions and ocean productivity (Cramer et al. 1999). This has been referred to as the Pacific Decadal Oscillation (PDO). It is apparent that ocean conditions that affect the productivity of Northwest salmon populations have been in a low phase of the cycle for some time. The variation in ocean conditions has been an important contributor to the decline of many stocks. However, the survival and recovery of the species depends on their ability to persist through periods of low ocean survival when stocks may depend on better quality freshwater habitat and lower relative harvest rates.

Recent information suggests that ocean conditions may have undergone a substantive change beginning in 1999 as indicated by cooler ocean temperatures, changes in species composition of zooplankton, fewer pelagic predators such as hake and mackerel, and the increased abundance of bait fish (B. Emmett, NMFS, pers. comm., w/ P. Dygert, NMFS, June 7, 2001). The most relevant indicator to this consultation has been the unprecedented return of upriver spring chinook in 2000 and 2001. The return in 2001 of over 400,000 upriver spring chinook to the Columbia River is the highest return by far since counts began at Bonneville Dam in 1938. Jack counts, which have been a reliable indicator of the recent returns, suggest that there will be another strong return in 2002.

In contrast, the extraordinary drought conditions in 2001 will adversely affect future return. The available water in the upper Columbia River basin is 50-60% of normal and will result in some of the lowest flow conditions on record. These conditions will have the greatest effect on upriver stocks that will have to migrate through the mainstem Columbia and Snake Rivers past many dams. The juveniles that must pass down river during the 2001 spring and summer out-migration will likely be significantly affected. At this point it is too early to tell how apparent change in ocean survival and poor out-migration conditions in 2001 will interact to affect returns after 2002.

Although it is not possible to review here the relative importance of each of these factors on

each ESU or stocks within the SRB, it is clear that it is the combined effect of all of the H's and changing survival conditions that has led to the decline and resulting current status of the species of concern. In this opinion, NMFS focuses on harvest, in the context of the environmental baseline and the current status of the species. Although harvest can be reduced in response to the species' depressed status and the reduced productivity that results from the degradations related to other human activities, the recovery of the listed species depends on improving the productivity of the natural populations in the wild. These improvements can only be made by addressing the factors of decline related to all of the H's that will be the subject of future opinions and recovery planning efforts.

### 3.5 Ocean Fisheries Effects

Impacts from ocean fisheries on listed spring/summer chinook and sockeye salmon have been considered in recent biological opinions. NMFS (1996b) concluded that it is highly unlikely that any SR sockeye salmon are taken in salmon fisheries off the west coast and that, although SR spring/summer chinook may on occasion be taken, the overall ocean exploitation rate is likely less than 1%. NMFS (1998b) also reviewed the potential impacts to steelhead for ocean salmon fisheries. Since steelhead are only rarely caught in these fisheries, it is unlikely that any of the listed or proposed steelhead ESUs are significantly impacted.

### 3.6 Columbia River Mainstem Fisheries Effects

Most mainstem harvest impacts to listed SR spring/summer chinook will already have occurred in 2001 prior to the fisheries addressed in this opinion. Specifically, SR spring/summer chinook salmon are taken in treaty Indian and non-Indian fisheries conducted in the winter, spring, and summer fisheries in the lower Columbia River mainstem, downstream of the mouth of the SR. These impacts were considered in a previous biological opinion (NMFS 2001b). In the biological opinion for winter/spring/summer mainstem Columbia River fisheries NMFS developed an abundance-based harvest rate schedule that allows for higher harvest rates in years of high abundance. With the unprecedented returns in 2001, the variable harvest rate schedule allows for harvest of up to 16% of naturally-produced SR spring chinook and up to 6 % of listed SR summer chinook salmon (NMFS 2001b).

The upriver spring chinook salmon count at Bonneville Dam (which includes fish destined for the SRB) ended on May 31, 2001 with unofficial results of 391,367 adults and 14,174 jack chinook. The actual harvest rate on SR spring chinook will likely be slightly less than the authorized in the Columbia River Mainstem Biological Opinion (NMFS 2001b). The projected harvest rate in tribal fisheries is about 13.5% with an additional harvest of 1.82% in non-Indian fisheries. The return of summer chinook to the lower mainstem began in early June within anticipated mainstem harvest rates of 1.7%.

## 3.7 Tributary Fisheries Effects

### 3.7.1 Tributary Tribal Fisheries Effects

The NPT has a pending authorization for a direct take fishery targeting surplus listed hatchery chinook salmon in the Imnaha River. The fishery was allowed to begin on June 1, 2001. The fishery will occur in the Imnaha River downstream of the trap and will target 160 listed hatchery-origin and 175 natural origin spring chinook salmon.

### 3.7.2 Tributary Recreational Fisheries Effects

As part of the NPT Tribal Plan for a direct take fishery in the Imnaha River basin, the State of Oregon is being considered an agent of the Tribes and received an allocation 335 spring chinook salmon for a recreational fishery in the lower Imnaha River. The 335 fish will target 299 hatchery-origin spring chinook salmon. All natural origin spring chinook will be released unharmed. The State of Oregon will be allowed an incidental mortality on natural-origin spring chinook of 36 fish (10% catch and release mortality on 360 natural origin fish).

Recreational fisheries which may take listed salmonids will also occur in the SRB in 2001. These fisheries are operated by the states of Oregon, Washington, and Idaho, under state regulations. Idaho recreational fisheries were considered previously pursuant to a section 10(a)(1)(B) permit application. Permit 1233 authorizes take associated with Idaho fisheries. Washington State submitted a Fishery Management and Evaluation Plan (FMEP) to seek authorization under section 4(d) of the ESA for their recreational fisheries in the SRB on May 22, 2001 (Atkins 2001). Oregon State is in the process of preparing an FMEP for recreational fisheries in the SRB. The State of Oregon will also serve as an agent of the Nez Perce Tribe and will institute a recreational fishery targeting listed, hatchery-origin spring/summer chinook salmon in the Imnaha River basin.

Although impacts associated with Oregon, Washington, and Idaho fisheries are not subject to consultation in this opinion, the resulting impacts, particularly those to SR spring/summer chinook salmon, are discussed briefly here and in the effects analysis to provide a more complete context for analyzing the fisheries that are considered here.

Idaho's mainstem Salmon River is open to general (resident species) recreational fishing year-round, from the mouth upstream to 200 yards downstream of the Sawtooth Hatchery weir, except for the 15 mile stretch from the mouth of the Middle Fork downstream. The only significant recreational salmon fisheries in the Salmon River Subbasin are those which occur in the Little Salmon/Rapid River and in the SFSR near the hatchery weir. Any fishery which Idaho may propose to harvest unlisted chinook salmon of hatchery-origin must be reviewed by NMFS for compliance with the Section 10 permit.

The state of Idaho has been authorized incidental take of listed spring/summer chinook salmon, fall chinook salmon, and sockeye salmon in recreational fisheries directed at unlisted salmon and kokanee. General season fisheries have the following authorizations: A total of 10 adult or jack spring/summer chinook salmon may be retained in certain general season fisheries, with an additional catch-and-release of up to 56 adults or jacks resulting in 5 mortalities. The take of up to 500 juvenile spring/summer chinook salmon is also anticipated in Idaho recreational fisheries conducted under General Fishing regulations, with the associated mortalities of up to 50 juveniles. Note that this take affects fish of a brood year subsequent to those of adults returning in 2001. Therefore, such juvenile impacts should remain in context of the total impacts to, and resultant prospects for replacement and survival of, the appropriate brood year upon return as adults. Evaluation of impacts to 2001 adult returns (brood years 1996 and 1997) must likewise include consideration of impacts to juveniles of brood years contributing to those returns; NMFS (1999) estimates that take of juvenile spring/summer chinook salmon represents less than 0.01 percent of the fish estimated to be produced in the SRB.

Anadromous Salmon Fishing Regulation in Idaho authorize the catch-and-release of adult, threatened, SR spring/summer chinook in the Rapid River/Little Salmon River fishery targeting non-listed hatchery-origin spring/summer chinook. In 2001 this fishery is anticipated to result in less than three mortalities.

In 2001, the state of Washington is considering a fishery for spring chinook in the area from Texas Rapids (downstream from Little Goose Dam) to Red Wolf Bridge in Clarkston. Regulations included the use of barbless hooks and only fish with an adipose fin clip could be retained. The fishery occurred in the month of May. Impacts to listed spring chinook will be included in the non-Indian 2% allocation for mainstem Columbia River fisheries (NMFS 2001b) and are accounted for as part of the impacts associated with lower river fisheries.

The State of Oregon recreational fishery targeting listed, hatchery-origin spring-chinook in the Imnaha River will target 350 listed hatchery origin chinook. 35 listed, natural origin chinook from the Imnaha River will be taken incidental to the fishery.

### 3.8 Previous Snake River Fisheries Impacts

Impacts from past SRB fisheries on listed spring/summer since 1992 are summarized in Table 7. Harvest rates exceeded harvest guidelines only in 1998 in the South Fork Salmon River. Impact to listed spring/summer chinook salmon in all other years and subbasins were well within past guidelines (LeFleur 2001a, Table 7).

Table 7. Annual tribal spring/summer chinook harvest rates in the South Fork Salmon , Grande Ronde and East Fork Clearwater Rivers, and in Lookingglass and Clear Creeks and number of fish harvested for Rapid River between 1992 and 2000. Bold font indicates that impact exceeded established harvest guidelines.

| | South Fork Salmon Total (hatch. + wild) | Grande Ronde Wild | Lookingglass Creek Wild | North Fork Clearwater Wild | Clear Creek Wild | Rapid River Wild |
|---|---|---|---|---|---|---|
| 1992 | 3.6% | 0% | 0% | 0% | 0% | 0 |
| 1993 | 10.1% | 0% | 0% | 0% | 0% | 0 |
| 1994 | 1.5% | 0% | 0% | 0% | 0% | 0 |
| 1995 | 1.0% | 0% | 0% | 0% | 0% | 0 |
| 1996 | 2.5% | 0% | 0% | 0% | 0% | 0 |
| 1997 | 7.0% | 0% | 0% | 0% | 0% | 0 |
| 1998 | **12.1%** | 0% | 0% | 0% | 0% | 15 fish |
| 1999 | 5.8% | 0% | 0% | 0% | 0% | 2 fish [3/] |
| 2000 | 15.0% | 0% | 0% | 0% | 0% | 4 fish [4/] |

[3/] fifteen wild fish released
[4/] 38 wild fish released

## 4.0 EFFECTS OF THE ACTION

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA and in 50 CFR §402.02. This section of the Biological Opinion applies those standards in determining whether the proposed fisheries are likely to jeopardize the continued existence of one or more of the threatened or endangered salmon and steelhead species (ESUs) that may be adversely affected by the fisheries. This analysis considers the direct, indirect, interrelated and interdependent effects of the proposed fisheries and compares them against the Environmental Baseline to determine if the proposed fisheries will appreciably reduce the likelihood of survival and recovery of these listed salmon in the wild.

In making the jeopardy determinations NMFS also considered the available information on the population or stock structure of each ESU when appropriate by reviewing both the status and impacts to components that were considered representative or important to the ESU as a whole. Many of the fisheries considered in this opinion are terminal tributary fisheries that target particular stocks. Unlike mixed stock fisheries such as those in the Columbia River mainstem that affect the ESU in general, terminal fisheries can be evaluated against information that is specifically related to particular stocks including critical threshold levels, abundance objectives, and preseason and inseason estimates of return. These stock specific circumstances were

considered in evaluating the proposed fisheries. The jeopardy determinations are based on quantitative assessments where possible and more qualitative considerations where necessary. Different methods and different types of information were used, reflecting what was available or could be developed as part of this consultation. NMFS expects that more quantitative and holistic analyses and risk assessments will become available in time. In the meantime, NMFS must rely on the best available information in making its judgment about the risk of the proposed action to the listed species. Jeopardy determinations in this opinion are also based on specific consideration of the magnitude and duration of harvest reductions made to date, the proposed management actions taken to reduce the catch of listed fish and the magnitude of the remaining harvest, particularly in comparison to the period of decline. NMFS sought to develop analyses that considered the status of the species, the environmental baseline, and the effects of the proposed actions, particularly given the context of other harvest activities that are likely to affect the species.

## 4.1 Effects on Critical Habitat

Critical habitat has been designated for SRB spring/summer chinook salmon. The essential features of the critical habitat are set out in the Environmental Baseline section of this opinion.

Critical habitat has been designated for each of the affected ESUs. While harvest activities do affect passage in that fish are intercepted, those impacts are accounted for explicitly in the following analyses regarding harvest related mortality. Most of the harvest related activities occur from boats or along river banks and will be of short duration. Gears that are used include primarily hook-and-line, gaff, spears, dipnets and hoop nets that do not substantively affect the habitat. There will be minimal disturbance to vegetation, and no harm to spawning or rearing habitat, or to water quantity and water quality. Thus there will be minimal effects on the critical habitat of this species from the actions discussed in this opinion, certainly not enough to contribute to a decline in the values of the habitat.

## 4.2 Factors to Be Considered

Fisheries may affect salmonid ESUs in several ways which have bearing on the likelihood of continued survival of the species. Immediate mortality effects accrue from the hooking or netting and subsequent retention of individual fish — those effects are considered explicitly in this opinion.

In addition, mortalities may occur to any fish which is caught and released. This is important to consider in the development of fishery management actions, as catch-and-release mortalities primarily result from implementation of management regulations designed to reduce mortalities to listed fish through live release. The catch-and-release mortality rate varies for different gear types, different species, and different fishing conditions, and those values are often not well known. Catch-and-release mortality rates have been estimated from available data and applied by TAC in the calculation of impacts to fish listed and proposed for listing evaluated in this

consultation. The TAC applies a 10% incidental mortality rate to salmon caught and released during recreational fishing activities. The TAC also applies a 1% incidental mortality rate to salmon caught and released using dipnets. Because many of the steelhead fisheries in the SRB occur in winter months, when water temperature is colder, hooking mortality is estimated to be 3.4% (1.7%-5.1%) (Pollard 1997). In the absence of data on catch-and-release mortalities in other fisheries considered in this opinion, TAC applies the same 10% mortality rate to all other fisheries practicing live release.

One of the primary considerations in evaluating these fisheries is the demographic effects on the survival and recovery of listed species. An important concern for many of the ESUs is the small size of the populations making up the ESU. Even when population trends are stable, a small population may be at significant risk of extinction due to environmental, demographic, or genetic stochasticity. The analysis of the proposed fisheries must be made in the context of whether the removal of fish from the upstream migrating salmonids will measurably reduce the sizes of extant populations and increase the risk of extinction of the ESU due to small constituent population sizes. This is especially important in evaluating the current proposal, since many of these fisheries take place in known-stock terminal or near-terminal areas, and each harvest impact can often be directly and specifically tied to a particular spawning population. NMFS has not yet defined the population structure of the SR spring/summer ESU consistent with the formal definitions in the recent paper on Viable Salmonid Populations (McElhany et al. 1999). However, NMFS previously identified 12 stocks or metapopulations which were segregated into approximately 40 subpopulations or breeding units based on genetic and geographic information (SRSRT 1994, NMFS 1995b). Until there is new information that better defines the population structure of the ESU, NMFS believes that it is important to continue to maintain, wherever possible, the stock structure that represents the inherent diversity of the ESU.

### 4.3 Effects of the Proposed Action

The evaluation of effects of the proposed fisheries to spring/summer chinook is given by Subbasin, including the mainstem SR and Tucannon, Clearwater, Salmon, Grande Ronde, and Imnaha rivers. Fisheries on the Salmon River are further divided to include those on the Rapid and Little Salmon rivers, and the SFSR. No steelhead, sockeye or fall chinook salmon are expected to be taken in the proposed fisheries, due to migration timing and fishery location. The analysis of effects therefore focuses on the expected take of SR spring/summer chinook. Only the effect of fisheries considered in ths opinion are described below.

#### 4.3.1 Mainstem Snake River to Hells Canyon Dam

*Treaty Indian fisheries:*
The NPT propose a ceremonial harvest up to 1,045 hatchery origin spring/summer chinook in this section of the SR in 2001. The areas open will include the SR from its confluence with the Clearwater River, upstream to Hells Canyon Dam. The targeted fishery will be in the vicinity of the historic tribal fishing site near Captain Johns Rapids. The predicted return of hatchery chinook past this site would be 40,955 adults. Of these, 3,213 (7.9%) are expected to be listed

Imnaha River hatchery returns (which are not distinguishable from any other hatchery fish), 3,746 (9.2%) are Grande Ronde wild/natural returns, and the expected wild/natural return to the South Fork of the Salmon is 8,331 (20.34%). Tribal harvest of 1,045 fish could thus result in an incidental take of 83 listed Imnaha hatchery fish (2.6% of the Imnaha run), 10 listed Grande Ronde Fish (0.27% of the Grande Ronde run), and 21 listed South Fork of the Salmon fish (0.25% of the South Fork of the Salmon run).

The SBT propose to harvest spring/summer chinook salmon in the unoccupied land areas of the mainstem SR and its tributaries in the area below Hells Canyon Dam in 2001. The SBT are proposing to fish on a more confined geographical area than the NPT and therefore are targeting/affecting a different group of fish. The Tribes propose to harvest 2.5% of the expected total return of 2,089 fish. This would result in the catch of 53 unlisted hatchery fish and one listed natural-origin fish returning to the Oxbow Hatchery weir.

### 4.3.2 Clearwater River Subbasin

Spring/summer chinook in the Clearwater River system were not included as part of the listed population of SR spring/summer chinook salmon. The straying of listed spring/summer chinook salmon into the Clearwater River system would be difficult or impossible to identify, as natural-origin populations have been established in several rivers in the system; given currently available data, no listed spring/summer chinook salmon are known to enter the Clearwater River Basin. Therefore, the proposed fisheries in this Subbasin are not expected to have any effect on listed spring/summer chinook salmon.

### 4.3.3 Salmon River Subbasin

For a detailed discussion and analysis of effects for the South Fork Salmon River fisheries, refer to section 6.1 of this opinion.

*Treaty Indian fisheries:*
The only tribal fisheries considered in this Biological Opinion are those in Rapid River and the SFSR and are described in the sections below. Other proposed fisheries constitute direct take fisheries and thus not part of this consultation.

#### 4.3.3.1 Rapid River

A small number of natural-origin summer chinook salmon typically return to Rapid River from late June through September. A similar number of unmarked spring chinook salmon also return to the Little Salmon River Basin, but it is believed that these fish are of Rapid River origin, as no spring chinook salmon of natural origin are known to have existed here historically (IDFG 1997). The early timing of the fishery limits the potential for impacts to the summer component of the natural-origin returns. In 2001, returns to Rapid River are projected to include 23,318 hatchery-origin adults and 597 naturally-produced adults, with an additional 220 unmarked adults expected to return to the Little Salmon River upstream of the confluence with Rapid River.

Proposed fisheries are designed to target the surplus hatchery-origin fish.

*Treaty Indian fisheries:*
The estimated return to Rapid River Hatchery is 23,318 fish, which is 20,338 fish more than the escapement goal of 2,980. The estimated listed chinook return to the Little Salmon River drainage is 817 adults (220 spring chinook and 597 summer chinook) according to recent IDFG estimates (IDFG 2001). The NPT has proposed a 2001 spring chinook fishery in the Little Salmon and Rapid rivers for a harvest which would take 10,170 hatchery and 36 wild/natural chinook for tribal subsistence. This take would represent 43.6% of predicted hatchery and 4.4% of wild returns. The fishing area for the Little Salmon River is from the Salmon River Bridge upstream of the Salmon River confluence. The fishing boundaries for Rapid River are from the confluence upstream to 60 feet downstream of the trap entrance. Effort and catch are distributed in Rapid River from the trap entrance to the confluence with the Little Salmon. Dates for the fishery will be set during April with anticipated opening from May through July; closures will be regulated inseason. Initially, fishing will be open to all traditional gear including gaff, dipnet, hoopnet, spear, long bow and hook and line. If the take of wild fish reaches 29 (80% of harvest ceiling) before the hatchery target take is reached, the fishery will be restricted to preclude the harvest of additional wild fish. This may be accomplished by season closure or by restriction of gear type to dipnet only with catch and release of wild fish.

During 2001 the SBT propose to fish for spring chinook in the Little Salmon River, from 60 feet downstream of the hatchery trap entrance downstream to the Salmon River Road Bridge at Riggins, Idaho. The SBT propose to limit harvest to 2.5% of the expected hatchery return (583 hatchery and 15 wild spring/summer chinook out of the expected return of 23,318 hatchery and 597 wild fish) in this area in 2001. Fisheries are expected to begin early May and to be curtailed by the end of June if necessary or earlier if significant numbers of wild summer chinook arrive at the hatchery weir. The SBT will manage this fishery under tribal regulations.

#### 4.3.3.2 South Fork Salmon River

Based on the Northwest Power Planning Council's presence/absence database, the majority (67%) of the wild spring/summer chinook smolt production capacity of the SFSR system is in the East Fork SFSR and the Secesh River drainage. Tribal fisheries will be located above these natural production areas and, harvest of fish destined to spawn in these tributaries is not expected. However, redd count data indicate the majority of natural spawning occurs in the mainstem South Fork.

The 2001 return to the SFSR hatchery weir projected preseason is 11,138 summer chinook salmon adults (LeFleur 2001a). This return is expected to be composed of approximately 2,566 listed naturally-origin adults, 1,235 listed supplementation hatchery-origin adults and 7,337 unlisted “reserve” group hatchery-origin adults. The difference between the supplementation and the “reserve” groups is that supplementation fish are descendants of one natural-origin and one hatchery-origin parent and the “reserve” group are descendants of two hatchery-origin parents. Because the area of the proposed tribal fisheries in 2001 extends a significant distance below the

weir and incorporates the important Poverty Flats natural spawning area, an estimate of naturally-produced adult returns destined for that area is needed also.

TAC provided an estimate of the number of natural spawners returning to the SFSR and its tributaries below the weir of 699 fish (LeFleur 2001a). The TAC forecast therefore includes more than just Poverty Flats index area spawners. TAC does not provide a specific forecast for Poverty Flats. IDFG provided a range estimate that was specific to the Poverty Flats index area of 498-757 natural spawners (IDFG 2001). The IDFG estimate is not only specific to the Poverty Flats index area, it is also based on more recent, site-specific information. For the purpose of this consultation, NMFS assumes that a conservative estimate of 500 summer chinook salmon of natural origin will return to the Poverty Flats area of the SFSR in 2001. Therefore, the total number of fish projected to return to the proposed fishery area is approximately 11,638 including 3,066 naturally-produced adults (2566 + 500), 7,337 "reserve" group hatchery-origin fish, and 1,235 supplementation fish.

*Treaty Indian fisheries:*
The SBT propose an 8% harvest rate on the hatchery run up to 108% (1,642) of the hatchery fish management goal of 1,520; and then harvest an additional 35% of the returns above 108% of the goal (LeFleur 2001a, Table 7). If the total rack return is 11,138 fish, then the SBT total harvest guideline will be 8% of 1,642 (131 fish), plus 35% of 9,496 (3,324 fish) for a total harvest of 3,455 adult chinook. The SBT propose a harvest guideline on listed fish of 380 fish which is 10 percent of the projected 3,801 (2,566 + 1,235) listed fish return. For the SFSR fishery targeting hatchery fish below the weir, the SBT propose a total harvest of 3,455 adult fish, of which no more than 380 would be listed. The SBT propose to harvest 2% (10 fish) of the 500 listed fish destined to Poverty Flats index area. This would allow a take of 10/{500/(500+3801)}= 86 listed fish in the Poverty Flats index area. After that point, fishing will only be allowed above Goat Creek. The 86 listed fish limit for Poverty Flats is a portion of the total harvest guideline of 380 listed fish for this fishery.

The NPT has proposed a 2001 spring/summer chinook subsistence fishery in the SFSR to target a harvest of 3,668 marked hatchery chinook predicted to return to the weir. The fishery as proposed would also be expected to take 219 wild/natural and/or listed hatchery chinook based upon the projected return for listed and unlisted chinook to the weir and to the area from Goat Cr. to confluence with the East Fork South Fork. The initial fishery would be indiscriminate in utilizing all traditional gear types. Based on proportion of listed fish to unlisted fish, this fishery would result in the indirect take of 200 natural origin fish while targeting 342 hatchery returns. This would be the trigger to restrict gear to dipnet only to target the remaining 3,326 hatchery-origin fish. All wild and hatchery listed fish caught are to be released. A handle rate of 1,945 listed fish is projected to occur while targeting the remaining allocated amount. Therefore, the dipnet fishery would have a catch-and-release mortality (1%) of an additional 19 listed chinook. Total impacts of the proposed NPT fishery in the SFSR would be 219 (5% of the run) listed fish. The projected returns on which harvest rates are based are subject to update inseason.

*Idaho Department of Fish and Game (IDFG) fishery:*

The impacts to spring/summer chinook salmon associated with IDFG fishery in the salmon river are discussed her although not specifically considered as part of the proposed action. IDFG proposes to conduct a fishery for summer chinook salmon on the upper South Fork Salmon River, similar to the recreational fishery in 1997 and 2000. The proposed fishery area is the 10 km reach from Goat Creek upstream to the SFSR weir, the same as in recent years. The fishery will target non-listed hatchery fish that are surplus to hatchery broodstock and natural production needs. Unlisted hatchery fish are adipose fin-clipped, so that they may be selectively harvested. Take will result from the incidental catch, handling and release of listed summer chinook and associated catch-and-release mortality. IDFG requested authorization for the lethal take of 144 adult, ESA listed summer chinook in the recreational fishery due to the catch and release of 1440 listed adults. Of these listed fish they estimate 994 will be natural-origin fish and 446 will be listed hatchery-origin fish. IDFG assumes a catch-and-release mortality of 10%.

### 4.3.4 Grande Ronde River Subbasin

*Treaty Indian fisheries:*
Lookingglass is a tributary to the Grande Ronde River. Spring chinook salmon returning to Lookingglass Creek Hatchery are not considered part of the listed SR spring/summer chinook salmon ESU. All fish returning to the hatchery area of Lookingglass Creek are unlisted out of basin stock fish. This hatchery stock is being phased out and is thus available for harvest. The goal this year is to harvest all returning unlisted hatchery stock fish to Lookingglass Creek. The NPT and CTUIR joint fishery in Lookingglass Creek is not expected to take any listed fish.

*Non-Indian recreational fishery:*
Oregon state proposed a recreational fishery on Lookingglass Hatchery Rapid River stock spring chinook returning to Lookingglass Creek this year. This fishery is not expected to take any listed fish.

## 5.0 CUMULATIVE EFFECTS

Cumulative effects are those effects of future Tribal, state, local or private activities, not involving Federal activities, that are reasonably certain to occur within the action area. For the purpose of this analysis, the action area is that part of the SRB described in section 1.2 above. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities will be reviewed through separate section 7 consultation processes. Non-Federal actions that require authorization under section 10 of the ESA, and that are not included within the scope of this consultation, will be evaluated in separate section 7 consultations.

Future Tribal, state and local government actions will likely to be in the form of legislation, administrative rules or policy initiatives. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could impact listed species or their habitat. Government actions are subject to political, legislative and fiscal uncertainties. These realities, added to geographic scope of the action area which encompasses numerous

government entities exercising various authorities and the many private landholdings, make any analysis of cumulative effects difficult and frankly speculative. This sections identifies representative actions that, based on currently available information, are reasonably certain to occur. It also identifies some goals, objectives and proposed plans by government entities, however, NMFS is unable to determine at this point in time whether any proposals will in fact result in specific actions.

## 5.1 State Actions

### 5.1.1 Oregon

Most future actions by the state of Oregon are described in the Oregon Plan for Salmon and Watershed measures, which includes the following programs designed to benefit salmon and watershed health:

• Oregon Department of Agriculture water quality management plans
• Oregon Department of Environmental Quality development of total maximum daily loads (TMDLs) in targeted basins; implementation of water quality standards
• Oregon Watershed Enhancement Board funding programs for watershed enhancement programs, and land and water acquisitions
• ODFW and Oregon Water Resources Department (OWRD) programs to enhance flow restoration
• OWRD programs to diminish over-appropriation of water sources
• ODFW and Oregon Department of Transportation programs to improve fish passage; culvert improvements/replacements
• Oregon Department of Forestry state forest habitat improvement policies and the Board of Forestry pending rules addressing forestry effects on water quality and riparian areas
• Oregon Division of State Lands and Oregon Parks Department programs to improve habitat health on state-owned lands
• Department of Geology and Mineral Industries program to reduce sediment runoff from mine sites
• State agencies funding local and private habitat initiatives; technical assistance for establishing riparian corridors; and TMDLs

If the foregoing programs are implemented, they may improve habitat features considered important for the listed species. The success and effects of such programs will depend on the continued interest and cooperation of the parties.

### 5.1.2 Washington

The state of Washington has various strategies and programs designed to improve the habitat of listed species and assist in recovery planning. Washington's 1998 Salmon Recovery Planning Act provided the framework for developing watershed restoration projects and established a funding mechanism for local habitat restoration projects. It also created the Governor's Salmon Recovery Office to coordinate and assist in the development of salmon recovery plans.

Washington's "Statewide Strategy to Recover Salmon," for example, is designed to improve watersheds.

The Watershed Planning Act, also passed in 1998, encourages voluntary planning by local governments, citizens, and Tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area or multi-Water Resource Inventory Area level. Grants are made available to conduct assessments of water resources and to develop goals and objectives for future water resources management. The Salmon Recovery Funding Act established a board to localize salmon funding. The board will deliver funds for salmon recovery projects and activities based on a science-driven, competitive process. These efforts, if developed into actual programs, should help improve habitat for listed species.

Washington's Department of Fish and Wildlife and tribal comanagers have been implementing the Wild Stock Recovery Initiative since 1992. The comanagers are completing comprehensive species management plans that examine limiting factors and identify needed habitat activities. The plans also concentrate on actions in the harvest and hatchery areas, including comprehensive hatchery planning. The department and some western Washington treaty Tribes have also adopted a wild salmonid policy to provide general policy guidance to managers on fish harvest, hatchery operations, and habitat protection and restoration measures to better protect wild salmon runs.

Washington State's Forest and Fish Plan may be promulgated as administrative rules. The rules are designed to establish criteria for non-Federal and private forest activities that will improve environmental conditions for listed species.

Water quality improvements will be proposed through development of TMDLs. The state of Washington is under a court order to develop TMDL management plans on each of its 303(d) water-quality-listed streams. It has developed a schedule that is updated yearly; the schedule outlines the priority and timing of TMDL plan development.

Washington State closed the mainstem Columbia River to new water rights appropriations in 1995. All applications for new water withdrawals are being denied based on the need to address ESA issues. The state established and funds a program to lease or buy water rights for instream flow purposes. This program was started in 2000 and is in the preliminary stages of public information and identification of potential acquisitions. These water programs, if carried out over the long term, should improve water quantity and quality in the state.

As with Oregon's state initiatives, Washington's programs are likely to benefit listed species if they are implemented and sustained.

### 5.1.3 Idaho

The Idaho Department of Environmental Quality will establish TMDLs in the SRB, a program regarded as having positive water quality effects. The TMDLs are required by court

order, so it is reasonably certain that they will be set. However, the same agency is considering relaxing other water quality standards in Idaho streams, which could have negative effects on water quality.

The state of Idaho has created an Office of Species Conservation to work on subbasin planning and to coordinate the efforts of all state offices addressing natural resource issues. The state actions targeted by this office include the following:

1. Continue diversion screening, in cooperation with BPA and BOR
2. Improve flow augmentation for fish passage through state programs
3. Implement the Forest Practices Act to maintain forest tree species, soil, air, and water resources and provide a habitat for wildlife and aquatic life.
4. Complete cumulative watershed effects assessments on more than 100 watersheds to support watershed planning.
5. Require 30-foot buffers along Class II streams.

These state-directed actions, if continued, will have positive effects for listed species and their habitat.

Demands for Idaho's groundwater resources have caused groundwater levels to drop and reduced flow in springs for which there are senior water rights. The Idaho Department of Water Resources has begun studies and promulgated rules that address water right conflicts and demands on a limited resource. The studies have identified aquifer recharge as a mitigation measure with the potential to affect the quantity of water in certain streams, particularly those essential to listed species.

### 5.1.4 General

Each state in the SRB administers the allocation of water resources within its borders. Water resource development has slowed in recent years. Most arable lands have already been developed, the increasingly diversified regional economy has decreased demand, and there are increased environmental protections. If, however, substantial new water developments occur, cumulative adverse effects to listed fish are likely. NMFS cooperates with the state water resource management agencies in assessing water resource needs in the Columbia River basin. Through restrictions in new water developments, vigorous water markets may develop to allow existing developed supplies to be applied to the highest and best use. Interested parties have applied substantial pressure, including ongoing litigation, on the state water resource management agencies to reduce or eliminate restrictions on water development. It is, therefore, impossible to predict the outcomes of these efforts with any reasonable certainty.

In the past, each state's economy depended on natural resources, with intense resource extraction. Changes in the states' economies have occurred in the last decade and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector,

is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement in all three states, a trend likely to continue for the next few decades. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will be negative, unless carefully planned for and mitigated. Some of the state programs described above are designed to address these impacts. Oregon also has a statewide, land-use-planning program that sets goals for growth management and natural resource protection. Washington State enacted a Growth Management Act to help communities plan for growth and address the effects of growth on the natural environment. If the programs continue, they may help lessen the potential for the adverse effects discussed above.

## 5.2 Local Actions

Local governments will be faced with similar but more direct pressures from population growth and movement. There will be demands for intensified development in rural areas as well as increased demands for water, municipal infrastructure and other resources. The reaction of local governments to such pressures is difficult to assess at this time without certainty in policy and funding. In the past local governments in the action area generally accommodated additional growth in ways that adversely affected listed fish habitat. Also there is little consistency among local governments in dealing with land use and environmental issues so that any positive effects from local government actions on listed species and their habitat are likely to be scattered throughout the action area.

In both Oregon and Washington, local governments are considering ordinances to address effects on aquatic and fish habitat from different land uses. The programs are part of state planning structures. Some local government programs, if submitted, may qualify for a limit under NMFS' 4(d) rule, which is designed to conserve listed species. Local governments may also participate in regional watershed health programs, although political will and funding will determine participation and, therefore, the effect of such actions on listed species. Overall, unless beneficial programs are comprehensive, cohesive, and sustained in their application, it is not likely that local actions will have measurable positive effects on listed species and their habitat and may even contribute to further degradation.

## 5.3 Tribal Actions

Tribal governments will continue to participate in cooperative efforts involving watershed and basin planning designed to improve fish habitat. The results from changes in Tribal forest and agriculture practices, in water resource allocations, and in changes to land uses are difficult to

assess for the same reasons discussed under State and Local Actions. The earlier discussions related to growth impacts apply also to Tribal government actions. Tribal governments will need to apply comprehensive and beneficial natural resource programs to areas under their jurisdiction to produce measurable positive effects for listed species and their habitat.

### 5.4 Private Actions

The effects of private actions are the most uncertain. Private landowners may convert current use of their lands, or they may intensify or diminish current uses. Individual landowners may voluntarily initiate actions to improve environmental conditions, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or may result from growth and economic pressures. Changes in ownership patterns will have unknown impacts. Whether any of these private actions will occur is highly unpredictable, and the effects even more so.

### 5.5 Summary

Non-federal actions on listed species are likely to continue affecting listed species. The cumulative effects in the action area are difficult to analyze considering the geographic landscape of this opinion, and the political variation in the action area, the uncertainties associated with government and private actions, and the changing economies of the region. Whether these effects will increase or decrease is a matter of speculation; however, based on the trends identified in this section, the adverse cumulative effects are likely to increase. Although state, Tribal and local governments have developed plans and initiatives to benefit listed fish, they must be applied and sustained in a comprehensive way before NMFS can consider them "reasonably foreseeable" in its analysis of cumulative effects.

## 6.0 INTEGRATION AND SYNTHESIS OF EFFECTS

SR sockeye and fall chinook salmon and steelhead are not likely to be adversely affected by the proposed fisheries. Following is a section describing the integration and synthesis of effects on SR spring/summer chinook.

### 6.1 Spring/summer chinook

The biological opinion and jeopardy determination relates to the SR spring/summer chinook ESU as a whole. This ESU includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon rivers. The SR spring/summer chinook ESU consists of 39 local spawning populations (subpopulations) spread over a large geographic area (Lichatowich et al. 1993). The number of fish returning to Lower Granite Dam is, therefore, divided among these subpopulations. The relationships between these subpopulations, and particularly the degree to which individuals may intermix, are unknown. Some or all of the fish returning to several of the hatchery programs are also listed including those returning to the Tucannon River, Imnaha, and Grande Ronde hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the

Salmon River.

The proposed SRB fisheries considered in this biological opinion will have little or no effect on most stocks within the basin. Only the NPT fishery in the mainstem SR is a "mixed-stock" fishery in the sense that it will impact the suite of stocks moving through the migration corridor. The other proposed fisheries are in terminal areas and will thus affect only the stocks returning to those areas. The expected returns for most listed stocks within the SRB represent a significant increase from recent years. Because of the confined and restricted nature of the fisheries, the expected impacts are quite low. However, there is concern with certain aspects of the SFSR fishery proposal, particularly with the potential level of impact to the Poverty Flats stock of the SFSR subbasin. The South Fork fishery is therefore discussed below in more detail.

The South Fork fishery will target unlisted, surplus, hatchery-origin fish returning to the South Fork hatchery weir. The expected return of hatchery-origin fish to the area that are available for harvest is on the order of 6,700 fish based on the preseason forecast of 7,337 and the "reserve" group hatchery escapement objective of approximately 600 fish. The area above the weir, referred to as Stolle Meadows, is managed for natural production, but is also supplemented with a separate group of *listed* hatchery-origin fish that are uniquely marked and have at least one natural-origin parent. The expected return of natural and listed hatchery-origin fish to the weir is 2,566 and 1,235, respectively. The Poverty Flats area is a located several miles downstream from the weir on the lower mainstem South Fork. It is also managed for natural production. The projected return to the Poverty Flats index area is 500 fish (IDFG 2001). The harvest management program for the SFSR is scaled to provide adequate escapement to the natural production areas. Allowable harvest therefore depends on the expected return in any given year.

The Secesh, East Fork South Fork, and Johnson Creek are tributaries off the lower mainstem South Fork. These are natural production areas. Johnson Creek is also supplemented using Johnson Creek origin broodstock. The proposed tribal fisheries will occur above the confluence with these tributaries; fish returning to these tributary are unlikely to be affected by the proposed fisheries.

NMFS has consulted with the Shoshone Bannock and NPT and State of Idaho about the proposed fisheries on the SFSR. NMFS' view is that there exists a differentiated stock structure in the South Fork and that proposed fisheries need to recognize and manage for those differences to the degree possible.

NMFS has identified and managed for five breeding units or subpopulations in the South Fork (BRWG 1994, Bevan et. al. 1994, NMFS 1995b) including:

- lower mainstem; SF mouth to Blackmare Ck. (including Poverty Flats)
- upper mainstem; SF Blackmare Ck. to Stolle Meadows
- Secesh River
- East Fork South Fork
- Johnson Ck.

It is unclear whether these would all be distinguished as "populations" as defined in NMFS' recent Viable Salmonid Population paper (McElhany et. al. 1999). However, review of the available genetic data indicates that genetic differences between major tributaries such as the Secesh, Johnson Creek, and mainstem are as large or larger than those between different tributaries in other major Snake Basins (e.g., Upper Salmon, Grande Ronde, Imnaha). Historically, it is probable that fish returning to the Poverty Flats area on the lower mainstem and the Stolle Meadows area on the upper mainstem were distinct as there is geographic separation between them that is magnified by elevation differences. There are also run timing differences between these stocks. Earlier spawn timing at Stolle Meadows is evident.

The Poverty Flat and Stolle Meadows stocks do not now show consistent genetic differences. It is clear that they have been affected by past events and practices, particularly the early brood stock and hatchery management practices at the South Fork Hatchery. These past practices have likely reduced differences between the populations within the mainstem South Fork, but have not resulted in their complete homogenization (pers. com, R. Waples, NMFS June 2, 2000 w/ P Dygert, NMFS). NMFS believes that it is important to continue to maintain as much of the inter-stock diversity as possible as part of an overall recovery strategy. NMFS therefore concludes that the fisheries should be managed in a way that accounts for the relative status of the Poverty Flats and Stolle Meadows stocks.

The lower mainstem South Fork includes, at its upper end, the Poverty Flats index area. The projected return to the Poverty Flats area is low, on the order of 500, compared to suggested lower threshold and recovery levels of 300 and 850, respectively (NMFS 2000a). The expected return to Poverty Flats of 500 spawners in 2001 is greater than the last 5-year average returns (208) including the 1996 and 1997 contributing brood years (Table 4). Nonetheless, conservative management is warranted until such time that actions can be taken to improve the long-term prospects of survival and recovery.

The upper mainstem South Fork, particularly the Stolle Meadows area which is above the hatchery weir, is in better shape. The area above the weir is managed for natural production, but is supplemented with a uniquely identified group of listed hatchery-origin fish each of which had at least one natural-origin parent. (The group of fish being targeted in the fishery are unlisted hatchery-origin fish that are the product of hatchery-origin parents.) The existing supplementation protocol requires that a limited number of natural-origin and listed hatchery-origin fish (32 adults from each group) be taken back to the hatchery to maintain the on-station supplementation brood stock program. The remaining fish are passed above the weir to spawn naturally subject to the condition that no more that half of the fish going above the weir will be from the listed supplementation group. No "reserve" group fish (hatchery x hatchery crosses), which are the target of the proposed fisheries, are allowed to pass above the weir. Based on the expected return of listed natural and hatchery-origin fish to the weir and the supplementation protocol, the expected number of fish that will be passed above the weir is 3,801 (minus terminal area impacts before the weir). To provide some perspective during consultation, NMFS again is proposing lower and recovery level bench marks of 300 and 690 for the Stolle Meadows area. The lower threshold is from the BRWG (1994) guidance, although NMFS is not aware of any

prior determination regarding whether this was a "small" or "large" stock as discussed by the BRWG. (The recommended lower threshold for small populations is 150.) The upper threshold was derived based on available estimates of the number of spawners necessary to achieve 70% of smolt production capacity. The expect return of 3,801 fish above the weir greatly exceeds the recovery abundance level and is much higher than in recent years, particularly the 1996 and 1997 brood years (Table 8). Even if we disregard the contribution of supplementation, the expected return is positive. The forecast of natural-origin returns is 2,566 which is much higher than the contributing brood years.

To summarize, the general circumstance is that the Poverty Flats area is relatively depressed, and the area above the weir is rebuilding and will exceed a reasonable interim upper level abundance objective in 2001. In response to these circumstances, NMFS proposed, during consultation, to use the two separate stepped harvest rate schedules developed in the year 2000 opinion (NMFS 2000a) for managing each of these areas, consistent with weak stock management principles. The first harvest rate schedule (Table 9) depends on the expected return of natural-origin spawners to the Poverty Flats index area; the second (Table 10) depends on the forecast return to the weir of natural-origin and hatchery-origin supplementation fish and the resulting expected number that would be passed above the weir as a result of the hatchery/genetic management protocol.

These harvest rate schedules were derived in 2000 (NMFS 2000a) based on schedules that have been used in recent years to manage Snake Basin fisheries including those in the South Fork (LeFleur 2000a). Also used here was a table that was specific to the Poverty Flats production area developed during the 2000 consultation (NMFS 2000a). The current tables are tied to the suggested threshold abundance levels. These threshold abundance levels should ultimately be reviewed and revised if necessary, but for now provide reasonable benchmarks of known origin that can be used to scale the fisheries. These schedules provide a framework for evaluating proposed fisheries.

The effect of using these harvest rate schedules is that fishing opportunity in the lower mainstem area is relatively limited. Given the anticipated return of 500 fish, the allowable harvest of natural-origin fish destined for the Poverty Flats index area is 30 fish (0.06 x 500 = 30). Given the anticipated preseason returns of listed natural and listed hatchery-origin fish to the weir (2,566 and 1,235, respectively), the expected number of fish over the weir is 3,801 and the allowable harvest rate, derived from the above schedule, is 12% of 773 plus 35% of 3028 (3801-773) or 1,152 listed fish. The actual take associated with the proposed fisheries is 743 listed fish, which is substantially less than what the abundance based harvest rate schedule would allow this year. Although the schedule allows for substantial harvest of listed fish, the expected escapement above the weir is still between 2,585 and 2,994, which is between 3.7 and 4.3 times larger than the recovery level benchmark of 690 fish.

Table 8. Adult Chinook above the South Fork Weir

| | |
|---|---|
| 1994 | 205 |
| 1995 | 85 |
| 1996 | 139 |
| 1997 | 535 |
| 1998 | 300 |
| 1999 | 235 |
| 2000 | 694 |
| *2001* | *3,801*[1] |

[1] Preseason expectation

Table 9. Harvest rate schedule for the Poverty Flats index area. Interim threshold levels are 300 and 850.

| % of Goal | Expected Return of N-O* Fish to Spawning Area | Harvest Rate - % of N-O Fish | Harvest - # of N-O Fish |
|---|---|---|---|
| | <50 | | 0 |
| | 51 - 150 | | 2 |
| | 151 - 300 | 2% | 2 - 6 |
| < 50% | 301 - 425 | 4% | 12 - 17 |
| 51% - 75% | 426 - 638 | 6% | 26 - 38 |
| 76% - 108% | 639 - 918 | 8% | 51 - 73 |
| > 108% | > 919 | 35% (of margin > 918) | > 73 |

* Natural-origin

Table 10. Harvest rate schedule for the upper mainstem South Fork (Stolle Meadows). Interim threshold levels are 300 and 690.

| % of Goal | Expected Return Above Weir | Harvest Rate - % of Listed Fish |
|---|---|---|
| | <50 | |
| | 51 - 150 | |
| < 50% | 151 - 345 | 4% |
| 51% - 75% | 345 - 518 | 9% |
| 76% - 112% | 519 - 773 | 12% |
| > 112% | > 773 | 35% (of margin > 773) |

It is important to note that the preseason return estimates will be updated inseason based on fish counts at the weir and other information. The resulting harvest rate and the associated numerical limit on take may change inseason as determined by the harvest rate schedule. The state of Idaho did provide some alternative, generally similar estimates of return that would result in a similar target harvest rate. However, since we have the ability to update the return to the upper mainstem area at least, it was unnecessary to try to resolve differences between the preseason estimates. NMFS therefore relied initially on the estimates provided in the biological assessment by TAC (LeFleur 2000a) with the exception of the Poverty Flats index area forecast which was provided by Idaho.

Because of the proposals by the tribes to fish in the Poverty Flats area, it is also necessary to define the limit of take for that area. Based on Idaho's estimated return to the Poverty Flats area of 500, the lethal take limit of listed fish from Poverty Flats would be 30 fish (Table 9). However, since fish destined for the upper area migrate through Poverty Flats, the take limit of natural-origin fish on Poverty Flats would be 258 fish (i.e. 30/[500/(500+ 3,801)] = 258). If we presume that there are 500 unmarked fish returning to Poverty Flats and 3,801 listed natural and hatchery-origin fish returning to the weir, then the lethal take of 258 listed fish from Poverty Flats would presumably include 30 fish that were destined for Poverty Flats and 228 that were passing through the area as they head for the weir. This calculation is conservative in that it assumes that there are no timing differences between listed fish from the respective areas and that they are therefore equally likely to be caught in fisheries in the lower area. In fact, there is reason to believe that fish returning to the Poverty Flats area have somewhat later return timing and may be more likely to hold in areas below the Poverty Flats index area. The probability of taking a fish destined for Poverty Flats is likely therefore less than is reflected by the above assumption that catch is proportional to relative abundance. Nonetheless, that is the assumption used; once 258 listed fish are taken from the Poverty Flats area, it would be closed to further harvest.

The Shoshone Bannock and NPT have both proposed to fish from the weir down through the Poverty Flats areas to the confluence with the East Fork South Fork. The SBT propose to harvest up to 380 total listed fish in the SFSR below the weir in 2001. The SBT also propose to limit the harvest of listed fish in the Poverty Flats area (including the harvest of 86 listed fish, which also includes 10 listed fish destined to Poverty Flats) . The NPT propose to harvest up to 219 listed fish in the SFSR below the weir in 2001, but do not define where the take will occur and do not provide measures to limit the take of listed fish in the Poverty Flats area. As a result, the combined effect of the proposed tribal fisheries could be the take of 305 (86 + 219= 305) listed fish at the Poverty Flats area, exceeding the 258 listed fish harvest limit for the Poverty Flats area.

Idaho's proposed SFSR fishery will result in the lethal take of 144 listed fish. However, Idaho is not proposing to fish at the Poverty Flats area and their projected take includes only listed fish destined for Stolle Meadows.

The combined harvest rate of the proposed state and tribal fisheries is 743 or 19.55% of 3,801 listed fish destined for the South Fork weir (380-SBT, 219-NPT, 144-ID). The state and tribal proposals are all defined in terms of harvest rate limits, so numerical impacts would change with changing run sizes. NMFS will use the harvest rate schedule shown in Table 10 to evaluate proposed fisheries affecting the Stolle Meadows stock. Given preseason expectations, the harvest rate schedule allows for a harvest rate of 30.3%. NMFS expects the fisheries to be managed within the overall take limit and believes that it can be done effectively by the managers through coordinated inseason monitoring and management actions. If the run size drops substantially, the harvest rate limit could be lower than 30.3%. At least for the Stolle Meadows stock, the sum of impacts from the proposed fisheries results in harvest rate that is substantially less than the allowable limit as defined in Table 10.

## 7.0 CONCLUSION

The NMFS has determined that recreational fisheries proposed by the state of Oregon and tribal C&S fisheries proposed to take place in the Snake Basin in 2001 are not likely to adversely affect SR sockeye salmon, SR fall chinook salmon, or SR steelhead.

The NMFS has determined that the proposed fisheries are likely to jeopardize the continued existence of SR spring/summer chinook salmon. This determination is based on impacts to spring/summer chinook salmon resulting from the combination of proposed fisheries in the SFSR, particularly the proposed tribal fisheries which will affect fish from the Poverty Flats stock.

The designated critical habitat features for spring/summer and fall chinook, sockeye salmon, and steelhead in the SR are not affected by the fisheries addressed here. The activities considered in this consultation will not result in the destruction or adverse modification of any of the essential features of the critical habitat.

## 8.0 REASONABLE AND PRUDENT ALTERATIVE

Regulations implementing section 7 of the ESA (50 CFR 402.02) define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technologically feasible; and (4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The key elements of the reasonable and prudent alternative were outlined in the previous synthesis section. The lower and upper mainstem South Fork areas will be managed separately using the harvest rate schedules presented in section 6.1. Table 9 and Table 10 define the allowable level of harvest mortality for fish returning to the Poverty Flats index area and the South Fork weir, respectively. These take limits are defined using preseason forecast information, but will be adjusted inseason based on updated information on run size when and where possible.

Given this years' preseason run size information, the take limit for fish returning to the Poverty Flats index area is 6% of the run or 30 fish. The initial allowable harvest rate on listed fish returning to the South Fork weir is 30.3% or 1152 fish based on the forecast return of 3801 listed fish.

Because of the relative status of the stocks, there is less opportunity to fish on the lower mainstem. Based on the relative abundance of listed fish expected to return to or pass through the lower area, the numerical limit on the harvest of listed fish in the area below the Poverty Flats Pack Bridge is 258 fish. Once the take of 258 listed fish is reached, the area below the Poverty Flats Pack Bridge shall be closed.

NMFS concludes that the harvest rate schedules developed during this consultation are consistent with survival and recovery objectives of the listed fish. The schedules are tied specifically to anticipated returns to each area in a particular year. The allowable harvests are conservative, allowing harvest rates that range from zero to 8% plus 35% of fish returning above the escapement goal for the Poverty Flats area, and zero to 12% plus 35% of the fish returning to the Stolle Meadows area, thus allowing for an assessment of productivity assumptions when escapements exceed interim abundance objectives.

The harvest rate schedule for Poverty Flats area is related to the status of the natural-origin fish. The harvest rate schedule for the Stolle Meadows area is fully integrated with the supplementation program, and scales harvest depending on the expected return above the weir given the management protocol for the supplementation program.

In considering the question of jeopardy it is also necessary to consider the proposed fisheries in the broader context of the ESU as a whole. As described above, proposed fisheries will be

limited to the geographic areas in the SRB that are influenced by hatchery production. As a result, only a few of the spring/summer chinook salmon subpopulations will be subject to any harvest associated with the proposed action. The Poverty Flats area has been the focus of much of this opinion, but it is one of five stocks identified in the SFSR which is, in turn, one basin of a much larger ESU. In the hatchery production areas where harvest will occur, harvest will be limited and represent a small portion of the listed fish returning to those particular areas. Management measures implemented through the Reasonable and Prudent Alternative to limit the take of fish destined for the Poverty Flats index area will reduce proposed harvest rates that were potentially as high as 7.1% to just 30 listed fish or 6% of the run. Taken from this broader perspective, the limited level of harvest proposed represents a reasonable accommodation for treaty Indian ceremonial and subsistence fisheries that will not substantially affect the species' prospects for survival and recovery. Based on these considerations, NMFS concludes that fisheries that are managed consistent with provisions of the South Fork framework in particular, and as otherwise proposed in the biological assessment, are not likely to jeopardize the continued existence of SR spring/summer chinook.

## 9.0 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary; they must be undertaken by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The action agencies have a continuing duty to regulate the activity covered in this incidental take statement. If the action agencies (1) fail to assume and implement the terms and conditions or (2) fail to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the agencies must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

## 9.1 Amount or Extent of Take Anticipated

No SR sockeye, fall chinook salmon or steelhead are expected to be taken as a result of the 2001 fisheries proposed for the SRB.

The proposed 2001 fisheries in the SRB will result in the incidental take of SR spring/summer chinook salmon. Anticipated take levels are shown by area and fishery in Table 11. No mortalities of listed SR spring/summer chinook salmon are expected in the non-Indian recreational fisheries proposed by Oregon and considered in this opinion. A total of 912 listed spring/summer chinook are expected to be taken in tribal fisheries, all resulting in mortalities. This includes both listed natural-origin and listed hatchery-origin fish that are destined to return to terminal areas in the SRB.

Fisheries for spring/summer chinook in the mainstem Snake and Little Salmon/Rapid River areas shall be managed subject to provisions described in the biological assessment and take limits shown in Table 11.

SBT and NPT tribal fisheries in the SFSR shall be managed subject to harvest rate, gear, timing and location provisions described in the biological assessment.

This consultation specifically considers proposed SBT and NPT tribal fisheries on the SFSR. However, the state of Idaho has also proposed fisheries in the SFSR which are authorized through section 10 permit 1233, subject to the requirement that the state fisheries be in compliance with total incidental take limits for the combined fisheries. This consultation therefore defines the take limit for the South Fork fishery that is applied to the tribal fisheries through this consultation and to the State of Idaho through permit 1233.

The take limit for natural-origin fish destined to return to the Poverty Flats index area is 30 fish as defined by the harvest rate schedule in Table 9 of this opinion. The take limit for listed fish returning to the South Fork weir based on preseason expectations is 30.3% of the run or 1152 listed fish as defined by the harvest rate schedule in Table 10 of this opinion. The overall harvest rate and associated take level is determined by the harvest rate schedule found in section 6.1 and may vary inseason based on updated estimates of run size.

As discussed above, fish returning to the Poverty Flats index area are relatively depressed and can sustain less harvest than those returning to the Upper Mainstem South Fork (Stolle Meadows) area. Fisheries in the lower area can target fish passing through, but will also likely affect fish destined for Poverty Flats. This incidental take statement therefore limits take of listed fish in the area below the Poverty Flats Pack Bridge to 258 fish. This is based on a 30 fish incidental take limit for Poverty Flats fish and the expectation that 228 listed fish from the upstream area will also be taken. Once 258 listed fish have been taken in the area below the Poverty Flats Pack Bridge, that area shall be closed to further fishing.

## 9.2 Effect of the Take

In this biological opinion, NMFS has determined that the level of anticipated take is not likely to jeopardize the continued existence of listed salmonid species or result in the destruction or adverse modification of designated critical habitat.

## 9.3 Reasonable and Prudent Measures

The NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of listed species:

| | |
|---|---|
| 1 | The tribes and the states shall manage their fisheries to minimize harvest impacts to listed salmonids consistent with their proposals as modified by the Reasonable and Prudent Alternative. |
| 2 | The tribes and the states shall conduct sufficient monitoring and enforcement activities to allow the accurate and timely enumeration of observed and estimated mortalities of listed hatchery-origin and natural-origin fish. |

## 9.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9, and any take prohibitions of threatened species established under section 4(d) of the ESA, the action agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

Table 11. Estimated take (and mortalities) of listed salmonids in 2001 Snake River Basin treaty Indian and non-Indian fisheries, with reasonable and prudent measure implemented. (NPT: Nez Perce Tribe; SBT: Shoshone-Bannock Tribes; CTUIR: Confederated Tribes of the Umatilla Indian Reservation; ODFW: Oregon Department of Fish and Wildlife; IDFG: Idaho Department of Fish and Game).

| Fishery | Total take (and mortality) of listed salmonids |
|---|---|
| | Spring/summer chinook salmon |
| **Mainstem Snake River** | |
| NPT Snake River Mainstem Spring/summer chinook | 394(117) |
| SBT Snake River Mainstem Spring/summer chinook | 1(1) |
| **Clearwater River** | |
| SBT Clearwater River Basin spring chinook | 0(0) |
| NPT Clearwater River Basin spring chinook | 0(0) |
| NPT Clear Creek spring chinook | 0(0) |
| NPT Crooked River/Red River spring chinook | 0(0) |
| NPT Lochsa spring chinook | 0(0) |
| NPT Selway spring chinook | 0(0) |
| **Salmon River** | |
| IDFG South Fork Salmon River spring/summer chinook [1] | 1440(144) [1] |
| NPT Little Salmon/Rapid River spring chinook | 360(36) |
| SBT Little Salmon/Rapid River spring chinook | 15(15) |
| NPT South Fork Salmon River spring/summer chinook | 2145(219) [2] |
| SBT South Fork Salmon River spring/summer chinook | 380(380) |
| **Grande Ronde River** | |
| ODFW Lookingglass spring chinook | 0(0) |
| NPT/CTUIR Lookingglass spring chinook | 0(0) |
| **Imnaha River** | 0(0) |

[1] Impacts from IDFG fisheries are considered but not subject to consultation in this opinion.
[2] The NPT will switch to selective gear (dipnets) once the mortality take limit of 200 listed fish is reached. Additional mortality from subsequent fishing accounts for the take of 19 additional listed fish.

1a. The state of Oregon and the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation and the Shoshone-Bannock Tribes must manage their fisheries to limit their harvest of spring/summer chinook salmon to the levels described in the biological assessment, as modified by this biological opinion. Inseason management actions taken during the course of the fisheries must be consistent with the harvest objectives established preseason as described in the biological assessment for the proposed action, as modified by the reasonable and prudent alternative of this biological opinion.

1b. The allowable catch in the proposed fisheries is dependent upon the expected return to the individual fishery locations. Initial projections of returns are made as described in the biological assessment. Expected returns can be refined as the season progresses, particularly as fish start arriving at hatchery weirs. The Nez Perce Tribe and the Shoshone-Bannock Tribes must therefore continuously monitor returns to each weir by contacting facility managers and other fishery management personnel as needed. TAC shall update return projections inseason as information is available, and shall report this information to NMFS as soon as the projections are updated.

1c. The allowable impact to listed species in the proposed SFSR fishery is dependent upon the actual return to the Poverty Flats and Stolle Meadows index areas. Initial projections of returns are made as described in the biological assessment. Expected returns to the Poverty Flats index area cannot be updated inseason, thus impact limits are set preseason. Expected returns to the Stolle Meadows index area can be refined as the season progresses, particularly as fish start arriving at SFSR weir. Therefore, the state of Idaho, the Nez Perce Tribe and the Shoshone-Bannock Tribes must therefore continuously monitor returns to the weir by contacting facility managers and other fishery management personnel as needed. TAC shall update return projections inseason as information is available, and shall report this information to NMFS as soon as the projections are updated. Inseason monitoring of catch must continue at levels sufficient to fully describe the composition of the catch, in terms of hatchery- vs. natural- origin, and listed vs. unlisted status, such that daily progress of the fishery toward guidelines and constraints can be determined and appropriate steps to modify or close fishery areas can be taken when necessary. This monitoring must take the form of fisheries personnel representing the appropriate fisheries co-manager(s) present at the time of any implemented fishery and conducting creel surveys, exit surveys, and personal observations of the course of the fishery, including enumerating number and types of fish caught by type of gear and by fishery area, numbers released by type of gear and fishery area, and other

information on the fishery related to the successful moderation of impacts to listed species. Any other method of determining take (both retained and released catch), must also be conducted as needed to provide fuller information on fishery impacts.

1d. Sampling of the fisheries for stock composition, including the collection of coded-wire tags and biological information, must also continue at levels comparable to those in recent years, and must be increased where necessary to insure a thorough post-season analysis of fishery impacts on listed species.

1e. The TAC shall forward to NMFS a postseason report detailing and summarizing the actual catch in all fisheries considered in this biological opinion. An analysis of impacts of these fisheries, on a site-by-site basis, on listed natural-origin and hatchery-origin fish should be a part of this report. Information on stock composition in terminal return areas and in fisheries obtained through coded-wire tag recoveries, genetic stock sampling, or sampling for other biological information should also be included. This report shall be provided to Enrique Patiño, NMFS, Sustainable Fisheries Division, Seattle, Washington, by April 15, 2002.

2a. Inseason monitoring of catch and other management measures must continue at levels sufficient to fully describe the composition of the catch, in terms of species, hatchery- vs. natural- origin, and listed vs. unlisted status (primarily reliant upon existence and type of mark), such that daily progress of the fishery toward guidelines and constraints can be determined and appropriate steps to modify or close each given fishery can be taken when necessary. In light of past years' incidents of implemented fisheries exceeding proposed guidelines, and considering the potential risks of overharvest of populations in terminal areas, timely inseason monitoring is especially critical. This monitoring must take the form of fisheries personnel representing the appropriate fisheries co-manager(s) present at the time of any implemented fishery and conducting creel surveys, exit surveys, and personal observations of the course of the fishery, including enumerating number and types of fish caught, numbers released, and other information on the fishery related to the successful moderation of impacts to listed species. Any other method of determining take (both retained and released catch), such as telephone surveys, must also be conducted as needed to provide fuller information on fishery impacts.

2b. Catch reports from the inseason monitoring programs for each management entity shall be provided to NMFS weekly or more often if

necessary to allow for implementation of management actions consistent with terms and conditions of this opinion.

2c. For areas in which listed spring/summer chinook salmon may occur, the Nez Perce Tribe and the Shoshone-Bannock Tribes shall curtail their chinook salmon fishery in that area when any of the guidelines for hatchery-origin and natural-origin adult harvest based on projected returns have been reached.

2d. Each entity opening a fishery shall take measures to reduce the deliberate illegal take of listed fish. These measures shall include extensive presence of law enforcement personnel representing the appropriate co-manager(s) at each potential fishing area, including areas which are not open to fishing but may experience illegal effort. Enforcement personnel and conservation officers of each entity shall report the incidental take of adult and juvenile listed salmon in the fisheries. Co-managers' personnel shall conduct creel surveys or other forms of angler contact to monitor the possible incidence of illegal harvest activity. Enforcement personnel and conservation officers of each entity shall coordinate with the other co-managers to best assure adequate coverage of fishery areas, and shall share, on a timely basis, information on potential enforcement issues obtained during enforcement, monitoring, redd counts, stream surveys, or other activities. The illegal take of listed fish should be described in the required report developed post-season by TAC, as described in Term and Condition 1e.

2e. Each entity opening a fishery shall take measures to prevent the inadvertent illegal take of listed fish. Each co-manager shall take measures to inform fishers on subjects such as differentiating listed from non-listed fish, avoiding redds, and methods for releasing non-target fish. Actions should also be taken to identify and protect, through warning signs or other means, critical spawning areas of listed salmon.

The NMFS believes that incidental take resulting from the proposed fisheries will be no greater than described in section XI(A), above. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The agencies must immediately provide an explanation of the causes of the excess taking, and review with the NMFS the need for possible modification of the reasonable and prudent measures.

## 10.0 CONSERVATION RECOMMENDATION

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed or critical habitat, to help implement recovery plans, or to develop information.

1. NMFS' Proposed Recovery Plan (NMFS 1995b) requires the development of Subbasin harvest management plans for the Snake River Basin. As part of the ongoing negotiations intended to produce a new Columbia River Fish Management Plan, the parties are currently engaged in such efforts. The tribes, states, and federal agencies should continue to develop production, supplementation, and harvest management guidelines for the Snake River Basin that are consistent with long-term recovery objectives for listed species.

2. The estimated return of natural-origin Snake River spring chinook includes fish destined for the Clearwater River which are not part of the ESU. There are currently no estimates of the proportion of the total return originating in the Clearwater River. The current assessments therefore overestimate both the expected return and numerical impacts to listed fish. TAC should develop the information necessary to distinguish between listed spring chinook and those destined for the Clearwater River.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

## 11.0 REINITIATION

This concludes formal consultation on the actions outlined in the biological assessment. As provided in 50 CFR §402.16, reinitiating of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the federal agency must reinitiate consultation immediately.

NMFS finds the terms and conditions contained in this opinion necessary for the conservation of the affected listed species. In arriving at these terms and conditions, NMFS has been mindful of affected treaty rights and its Federal trust obligations. NMFS will reconsider the terms and conditions in this opinion that affect treaty rights in the event new information indicates such

reconsideration is warranted.

## 12.0 MAGNUSON-STEVENS ACT ESSENTIAL FISH HABITAT CONSULTATION

"Essential fish habitat" (EFH) is defined in section 3 of the Magnuson-Stevens Act (MSA) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NMFS interprets EFH to include aquatic areas and their associated physical, chemical and biological properties used by fish that are necessary to support a sustainable fishery and the contribution of the managed species to a healthy ecosystem.

The MSA and its implementing regulations at 50 CFR 600.920 require a Federal agency to consult with NMFS before it authorizes, funds or carries out any action that may adversely effect EFH. The purpose of consultation is to develop a conservation recommendation(s) that addresses all reasonably foreseeable adverse effects to EFH. Further, the action agency must provide a detailed, written response NMFS within 30 days after receiving an EFH conservation recommendation. The response must include measures proposed by the agency to avoid, minimize, mitigate, or offset the impact of the activity on EFH. If the response is inconsistent with NMFS' conservation recommendation the agency must explain its reasons for not following the recommendations.

Thus, one of the objectives of this consultation is to determine whether the proposed actions—implementation of fisheries for SR spring/summer chinook salmon— are likely to adversely affect EFH. If the proposed actions are likely to adversely affect EFH, conservation recommendations will be provided.

### 12.1 Identification of Essential Fish Habitat

The Pacific Fishery Management Council (PFMC) is one of eight Regional Fishery Management Councils established under the Magnuson-Stevens Act. The PFMC develops and carries out fisheries management plans for Pacific coast groundfish, coastal pelagic species, and salmon off the coasts of Washington, Oregon and California. Pursuant to the MSA, the PFMC has designated freshwater and marine EFH for chinook and coho salmon (PFMC 1999). For purposes of this consultation, freshwater EFH for salmon in the SRB includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to Pacific salmon, except upstream of the impassable dams. In the future, should subsequent analyses determine the habitat above any impassable dam is necessary for salmon conservation, the PFMC will modify the identification of Pacific salmon EFH (PFMC 1999). Marine EFH for Pacific salmon in Oregon and Washington includes all estuarine, nearshore and marine waters within the western boundary of the U.S. Exclusive Economic Zone (EEZ), 200 miles offshore.

### 12.2 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in detail above. The action is the issuance of an incidental take statement pursuant to section 7 of the ESA. The proposed action area is the SRB. A more detailed description and identification of EFH for salmon is found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts on these species' EFH from the above proposed action is based on this information.

### 12.3 Effects of the Proposed Action

Based on information submitted by TAC, as well as NMFS' analysis in the ESA consultation above, NMFS believes that the effects of this action on EFH are likely to be within the range of effects considered in the ESA portion of this consultation.

### 12.4 Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NMFS has determined that the proposed actions are not likely to adversely affect EFH Pacific salmon

### 12.5 EFH Conservation Recommendation

The Reasonable and Prudent Measures and the Terms and Conditions outlined above are applicable to designated salmon EFH. Therefore, NMFS recommends that those same Reasonable and Prudent Measures, and the Terms and Conditions be adopted as the EFH Conservation Recommendation for this consultation.

### 12.6 Statutory Response Requirement

Section 305(b)(4)(B) of the MSA and implementing regulations at 50 CFR section 600.920 require a Federal action agency to provide a detailed, written response to NMFS within 30 days after receiving an EFH conservation recommendation. The response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the impact of the activity on EFH. If the response is inconsistent with a conservation recommendation from NMFS, the agency must explain its reasons for not following the recommendation.

### 12.7 Consultation Renewal

The action agencies must reinitiate EFH consultation if plans for these actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR Section 600.920(k)).

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**APPENDIX 1.** Projected preseason Lower Granite Dam counts and Snake River tributary returns of spring and summer chinook in 2001.

| | Chinook | | |
|---|---|---|---|
| | Spring | Summer | Total |
| Lower Granite Dam Total | | 4,628 | 92,951 |
| Lower Granite Dam Hatchery | 75,319 | 2,276 | 77,595 |
| Lower Granite Dam Wild | 17,632 | 2,352 | 19,984 |
| Lookingglass Hatchery fish at LWG 1/ | 0 | | |

| | Spring/Summer Chinook Returns | | | |
|---|---|---|---|---|
| Tributary | Hatchery | Wild/Natural | Listed | Total |
| Snake River | | | | |
| Oxbow Hatchery | 2,067 | 22 | 22 | 2,089 *2/* |
| Tucannon River | 125 | 125 | 250 | 250 *3/* |
| Clearwater River | | | | |
| Clearwater Wild/Natural | 0 | 1,727 | 0 | 1,727 *4/* |
| Red River Rack & | | | | |
| Crooked River | 3,976 | 232 | 0 | 4,208 *5/* |
| Powell Rack | 5,359 | 235 | 0 | 5,594 *6/* |
| Dworshak Hatchery | 6,663 | 0 | 0 | 6,663 *7/* |
| Kooskia Hatchery | 5,841 | 0 | 0 | 5,841 *8/* |
| Salmon River | | | | |
| Little Salmon Wild/Natural & | 0 | 220 | 220 | 220 *9/* |
| Rapid River Hatchery | 23,318 | 597 | 597 | 23,915 *10/* |
| Lower Main Salmon Wild/Natural | 0 | 76 | 76 | 76 *11/* |
| Middle Main Salmon Wild/Natural | 0 | 158 | 158 | 158 *12/* |
| South Fork Salmon Wild/Natural | 0 | 699 | 699 | 699 *13/* |
| South Fork Salmon River Rack | 8,572 | 2,566 | 3,801 | 11,138 *14/* |
| Middle Fork Salmon Wild/Natural | 0 | 1,948 | 1,948 | 1,948 *15/* |
| Panther Creek Wild/Natural | 0 | 0 | 0 | 0 *16/* |
| Lemhi River Wild/Natural | 0 | 206 | 206 | 206 *17/* |
| Pahsimeroi Hatchery | 382 | 78 | 460 | 460 *18/* |
| Sawtooth Hatchery | 1,093 | 732 | 1,825 | 1,825 *19/* |
| East Fork Rack | 0 | 0 | 0 | 0 *20/* |
| Upper Main Salmon Wild/Natural | 0 | 843 | 843 | 843 *21/* |
| Headwaters Salmon Wild/Natural | 0 | 208 | 208 | 208 *22/* |
| Grande Ronde River | | | | |
| Grande Ronde Subbasin | 515 | 3,697 | 4,212 | 4,212 *23/* |
| Lookingglass Hatchery | 1,795 | 49 | 0 | 1,844 *24/* |
| Imnaha River | | | | |
| Imnaha Subbasin | 3,213 | 3,518 | 6,731 | 6,731 *25/* |
| TOTAL | 62,919 | 17,936 | 22,256 | 80,855 |

**Footnotes for Appendix 1.**

1/ Lookingglass Hatchery fish will not be trapped at LWG in 2001.

2/ Oxbow Hatchery. Independent prediction by IDFG.

3/ Tucannon River. Independent prediction by WDFW.

4/ Clearwater Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0864). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

5/ Red River Rack and Crooked River Rack. Independent prediction by IDFG.

6/ Powell Rack. Independent prediction by IDFG.

7/ Dworshak Hatchery. Independent prediction by USFWS.

8/ Kooskia Hatchery. Independent prediction by USFWS.

9/ Little Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0110). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

10/ Rapid River Hatchery. Independent prediction by IDFG.

11/ Lower Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0038). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

12/ Middle Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0079). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

13/ South Fork Salmon Wild/Natural. Includes South Fork Salmon River and tributaries below South Fork Weir. Proportion spring/summer smolt production above Lower Granite Dam (.0350). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

14/ South Fork Salmon River Rack. Independent prediction by IDFG.

15/ Middle Fork Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0975). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

16/ Panther Creek Wild/Natural. IDFG and SBT consider this run extirpated.

17/ Lemhi River Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0103). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

18/ Pahsimeroi Hatchery. Independent prediction by IDFG.

19/ Sawtooth Hatchery. Independent prediction by IDFG.

20/ East Fork Rack. Independent prediction by IDFG.

21/ Upper Main Salmon Wild/Natural. Includes Salmon River and tributaries from the Middle Fork Salmon River up to and including the Yankee Fork Salmon River. Proportion spring/summer smolt production above Lower Granite Dam (.0422). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

22/ Headwaters Salmon Wild/Natural. Includes Salmon River and tributaries from below Sawtooth Hatchery downstream to the Yankee Fork. Proportion spring/summer smolt production above Lower Granite Dam (.0104). Values from Subbasin Planning Smolt Density Model, StreamNet, 1/16/97.

23/ Grande Ronde Subbasin. Independent prediction by ODFW. Does not include Lookingglass Creek returns.

24/ Lookingglass Hatchery. Independent prediction by ODFW.

25/ Imnaha Subbasin. Independent prediction by ODFW.